FEDERAL RESERVE BANK OF KANSAS CITY

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How Did the 2018–19 U.S. Tariff Hikes Influence Household Spending?

By Jun Nie, Alice von Ende-Becker, and Shu-Kuei X. Yang

In 2018 and 2019, U.S. tariffs on imports from other countries rose significantly, particularly on imports from China. Although higher tariffs may raise costs for both foreign and domestic firms, recent studies suggest most of the burden fell on U.S. businesses and consumers due to higher prices and fewer imports. But tariffs do not affect all categories of goods evenly, nor do all households spend the same share of their income on tariff-affected goods. As a result, the ultimate effect of tariff increases on household spending may differ across households.

Jun Nie, Alice von Ende-Becker, and Shu-Kuei X. Yang construct a tariff intensity measure to assess the uneven effects of the 2018–19 tariff increases across different types of households. They find that low-income households were more exposed to tariff increases than high-income households; younger households were more exposed than older households; Black households were more exposed than white or Asian households; and Hispanic households were more exposed than non-Hispanic households. In addition, they find that the tariff increases led to only a small shift in household spending from categories that were more exposed to tariff increases to categories that were less exposed to tariff hikes by the end of 2019.

Prepaid Cards: An Inadequate Solution for Digital Payments Inclusion

By Ying Lei Toh

Payments researchers and industry advocates have proposed prepaid cards as a potential solution for addressing digital payments exclusion and improving unbanked households' access to financial services. Prepaid cards, which do not require internet access to use, can allow unbanked households to shop, receive paychecks, pay bills, and make peer-to-peer transfers.

Ying Lei Toh uses data from the FDIC's 2019 Survey of Household Use of Banking and Financial Services to assess whether prepaid cards might improve digital payments inclusion among unbanked households. She finds that unbanked households have low adoption rates of prepaid cards overall, though those who are age 25 to 44, white, employed, or have income between $30,000 and $75,000 are more likely to use prepaid cards. She also finds that prepaid cards have limited success in addressing commonly cited barriers to bank account ownership. Specifically, she finds that prepaid cards are more effective at addressing the barriers of high or unpredictable account fees and personal identification, credit, or former account problems,

but less effective at overcoming the barriers of liquidity constraints, privacy concerns, and poor accessibility. Her results suggest that prepaid cards are not a comprehensive solution to overcoming digital payments exclusion or common barriers to financial account ownership.

How the Pandemic Influenced Trends in Domestic Migration across U.S. Urban Areas

By Jason P. Brown and Colton Tousey

Prior to the COVID-19 pandemic, net domestic migration in the United States was generally increasing in smaller urban areas while declining in the largest urban areas; as people sought to mitigate exposure to COVID-19 and avoid stricter lockdown measures, the pandemic may have accelerated this trend. Changes in domestic migration trends may influence the longer-term growth prospects of places, but investigating recent trends in domestic migration can be challenging because data from official government sources are released with a long lag.

Jason P. Brown and Colton Tousey overcome this lag by using higher frequency information on address changes self-reported by consumers, and use these data to assess whether domestic migration between urban areas changed after the onset of the pandemic. They find that the rate of net domestic migration increased further in small and medium urban areas and declined further in very large urban areas. Moreover, the relationship between net domestic migration and two of its historical driving factors—population density and natural amenities—diminished only slightly during the pandemic. Their findings suggest that though the pandemic influenced net domestic migration, it has not yet drastically altered migration trends to less crowded urban areas with higher natural amenities.

How Did the 2018–19 U.S. Tariff Hikes Influence Household Spending?

By Jun Nie, Alice von Ende-Becker, and Shu-Kuei X. Yang

U.S. tariffs on imports from other countries rose significantly in 2018 and 2019, particularly on imports from China. The average tariff rate on imports from China increased by more than 15 percentage points from January 2018 to December 2019 and affected more than $350 billion of imported goods. Although higher tariffs may raise costs for both foreign and domestic firms, recent studies suggest most of the burden fell on U.S. businesses and consumers due to higher prices and fewer imports (Fajgelbaum and others 2020; Amiti, Redding, and Weinstein 2019, 2020).

Tariffs do not affect all categories of goods evenly, nor do all households spend the same share of their income on tariff-affected goods. As a result, the ultimate effect of tariff increases on household spending may differ across households. However, measuring these effects is challenging, as it requires combining two distinct data sets that define goods categories differently. The Consumer Expenditure Survey administered by the Bureau of Labor Statistics provides detailed data on hundreds of household spending categories, but these categories generally do not match the descriptions of goods in trade data from the U.S.

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International Trade Commission's Harmonized Tariff Schedule, making comparisons difficult.

In this article, we link expenditure and tariff data and construct a tariff intensity measure to evaluate the degree to which each category of household expenditures has been exposed to recent tariff increases. We find that the tariff increases in 2018–19 may have generated uneven effects across different types of households. Specifically, we find that low-income households are more exposed to tariff increases than high-income households; younger households are more exposed than older households; Black households are more exposed than white or Asian households; and Hispanic households are more exposed than non-Hispanic households. In addition, we find that the tariff increases led to only a small shift in household spending from categories that were more exposed to tariff increases to categories that were less exposed to tariff hikes by the end of 2019.

Section I provides an overview of the key changes in U.S. trade policies during 2018–19. Section II reviews recent research on the effect of tariff increases on the U.S. economy and shows that U.S. consumers and importers have borne the greatest cost. Section III introduces our measure of tariff intensity and shows that the tariff increases had different effects on households by income level, age, race, and ethnicity.

I. Overview of Trade Policies in 2018–19

In 2018, the United States increased tariffs on a wide range of imported goods. One of the main purposes of these tariff hikes was to encourage domestic firms to rely less on foreign producers and instead increase domestic production and manufacturing jobs (Zumbrun and Davis 2020). Indeed, the share of U.S. employment in the manufacturing sector had declined from 26 percent in 1970 to 9 percent in 2017. In addition, the U.S. trade deficit in goods, which measures the difference between the amount of goods the United States purchases from foreign countries and the amount of goods the United States sells to foreign buyers, nearly doubled from 2000 to 2017. By the end of that period, China accounted for nearly half of the U.S. total trade deficit in goods.

The changes in U.S. trade policy in 2018–19 were unprecedented in both size and scope. In general, tariffs were implemented in two

stages. Chart 1 shows that the first stage began in January 2018, when the United States applied 30 percent and 20 percent tariffs to solar panels and washing machines, respectively, from a wide range of countries. These tariffs were quickly followed in March 2018 by 25 percent and 10 percent tariffs on steel and aluminum, respectively. These tariffs applied to imports of those goods regardless of their country of origin, though several countries were initially exempted from the tariff.[1]

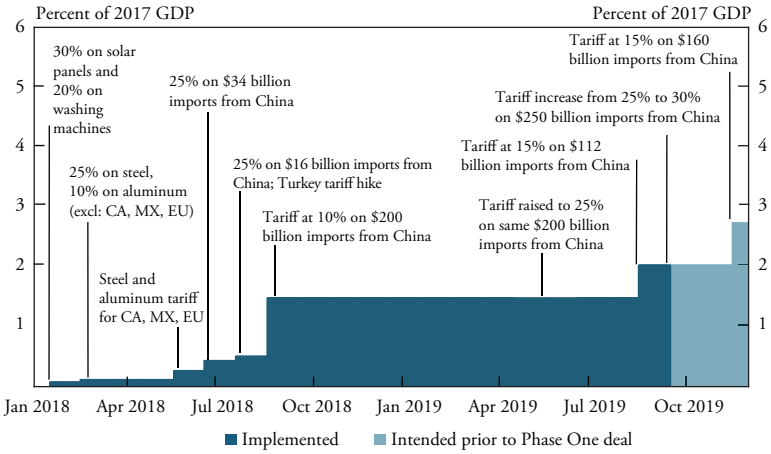
The second stage began in July 2018 and involved multiple rounds of tariff hikes mostly on imports from China. The Trump administration began this stage by imposing a 25 percent tariff on $34 billion of imports from China. In August, the administration imposed another 25 percent tariff on an additional $16 billion of imports from China. These tariffs mainly targeted intermediate goods, such as semiconductors and plastics. Following the U.S. announcements of the July and August tariff hikes, China responded by imposing their own tariffs on an equivalent value of U.S. goods.

In response to China's retaliatory tariffs, the Trump administration expanded the scope of tariffs on Chinese imports. In September 2018, the United States imposed a third tariff covering another $200 billion of imports from China. Although this tariff was initially only 10 percent, it was broader in scope, applying to consumer goods such as luggage and home appliances. Indeed, Chart 2 shows the accumulated value of consumer goods targeted by tariffs (blue bar) rose from a level of around zero during the July and August tariffs to $42 billion after the September tariff, which represents 17 percent of total imported goods from China covered by tariff increases at the time.[2] Following failed trade negotiations with China, the Trump administration raised the tariff on these items from 10 percent to 25 percent in May 2019.

In September 2019, the Trump administration introduced a new 15 percent tariff on $112 billion of additional imports from China. This tariff also applied to a substantial number of consumer goods, including clothing and shoes, increasing the direct effect of the trade war on U.S. consumers. The Trump administration also scheduled for December 2019 another 15 percent tariff on $180 billion of imports from China—mainly capital goods, such as textile machinery, but also further consumer goods, such as computers and other electronics. If implemented, this tariff would have brought the total amount of

Chart 1

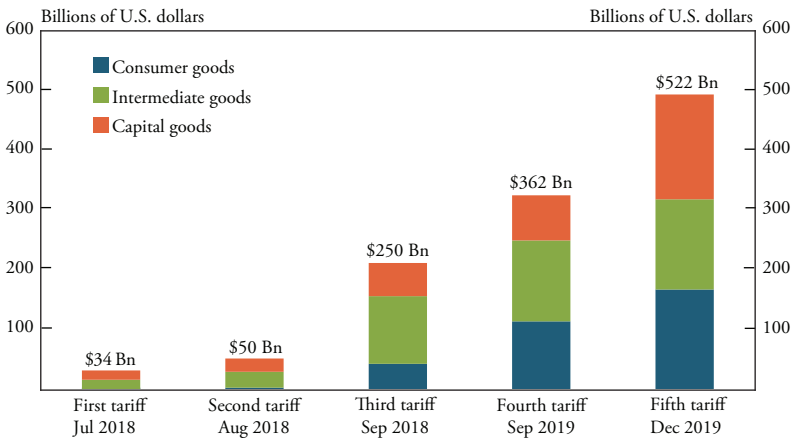
U.S. Tariff Timeline



Note: Canada, Mexico, and the European Union (CA, MX, and EU in the chart) were initially exempted from the tariffs on steel and aluminum.
Sources: Peterson Institute for International Economics and authors' calculations.

Chart 2

Composition of Imported Goods from China Covered in Each Round of Tariff Hike



Notes: The sum of the value of the components may not equal the total value of each bar, as some items were later exempted from tariff increases. In addition, the fifth tariff was not implemented due to the "Phase One" trade deal reached between the United States and China in January 2020.
Sources: U.S. International Trade Commission and authors' calculations.

Chinese imports facing tariffs to over $500 billion. However, the administration canceled this tariff—and reduced the September tariff from 15 percent to 7.5 percent—in anticipation of a trade deal between the United States and China. The "Phase One" trade deal was finalized on January 15, 2020.

Overall, the 2018–19 tariff hikes mainly targeted imports from China. By the time the Phase One trade deal was reached in early 2020, the United States had imposed tariffs on 65 percent of imports from China—12 percent of total goods imported to the United States.[3] In addition, over 75 percent of the Chinese imports targeted by tariffs were either consumer goods or intermediate goods. The magnitude of the tariff changes in 2018–19 suggests they likely had a meaningful effect on U.S. importers and consumers. But who bore the greatest cost—U.S. importers, Chinese exporters, or U.S. consumers?

II. The Effects of the 2018–19 Tariffs on U.S. Importers and Consumers

The unprecedented scale of tariff increases in 2018–19 has spurred many studies of the effects of these tariff changes on the United States. These studies have largely focused on how increased tariffs on imports from China affected import prices, import quantities, and economic welfare. They find, overall, that the increases in tariffs on imports from China in 2018–19 reduced imports from China, raised costs for U.S. importers, and caused welfare losses to the U.S. economy.[4]

One consistent finding in recent studies is that U.S. imports declined substantially in response to higher tariffs. For example, Fajgelbaum and others (2020) use monthly data from the U.S. International Trade Commission from January 2017 to April 2019 and find that imports of a given product from a country targeted by U.S. tariffs fell 31.7 percent on average, though total imports of this product from all countries fell only 2.5 percent. In other words, imports from untargeted countries increased, but not enough to offset the decline in imports from targeted countries.

Another consistent finding is that U.S. importers and consumers have borne nearly all the costs from increased tariffs. Fajgelbaum and others (2020) show that the prices of imports targeted by tariffs in 2018–19 did not fall, implying the higher tariff rates completely passed

through to duty-inclusive prices. Cavallo and others (2021) confirm this finding, showing that a 20 percent tariff is associated with a 1.1 percent decline in the price charged by foreign suppliers and an 18.9 percent increase in the total price (including the tariffs) paid by U.S. importers. Fajgelbaum and others (2020) estimate the resulting losses to U.S. consumers and firms that buy imports to be $51 billion, or 0.27 percent of GDP. After accounting for tariff revenue and gains to domestic producers, the aggregate real income losses are $7.2 billion, or 0.04 percent of GDP.

Finally, some evidence suggests tariffs have also protected U.S. producers from foreign competition, enabling them to raise prices and markups. Amiti, Redding, and Weinstein (2019) estimate that the 2018–19 tariffs raised the average price of U.S. manufacturing goods by 1 percentage point, which is sizable given that the average inflation rate over the last 10 years was below 2 percent. However, few studies directly estimate the effect on consumer prices. One exception is Cavallo and others (2021), who find that retailers absorbed most of the increase in the cost of affected imports by earning lower profit margins—but their microdata also show that retailers increased their import shipments from China, substantially expanding their inventories before tariffs were implemented. The authors speculate that if the tariffs remain in place, pressure on these retailers will likely rise.

Together, these studies suggest that recent increases in tariffs reduced U.S. imports and that the costs have been passed through entirely to U.S. importers, retailers, and consumers. Although the tariffs caused some increases in consumer prices and manufacturing prices, most of the costs appear to have been absorbed by U.S. firms, at least by the end of 2019.

III. The Effects of the 2018–19 Tariffs on Different U.S. Households

Although recent studies show that the higher tariffs have partly passed through to U.S. households, they do not show whether households adjusted their spending in response to these tariffs. Given the price increases in certain categories of goods, households may have switched their spending to less exposed categories of goods. In addition, recent studies have not assessed whether certain types of

households were more affected by tariff hikes than others. Differences in tariff exposure across households seem likely: for example, older households may spend relatively more on health services, which were not targeted by tariffs, while younger households may spend relatively more on sports equipment, which was targeted by tariffs. An accurate assessment of potential shifts in spending or differences in exposure by household requires us to take into account the whole distribution of expenditures as well as the degree to which different types of expenditures are exposed to tariff hikes.

As a first step, we combine detailed household expenditures data with tariff data to construct a measure of different expenditures' exposure to tariffs, or "tariff intensity." Specifically, we map 16,475 import products with 10-digit Harmonized Tariff Schedule (HTS) codes to 598 spending categories in the Consumer Expenditure Survey (CEX) based on Universal Classification Codes (UCC).[5] Each UCC expenditure category contains one or more HTS products. The tariff intensity for each UCC expenditure category is thus defined as the share of HTS products targeted by tariff increases within the expenditure category.[6] Table 1 shows a few examples of UCC expenditure categories along with the count of HTS products in those categories and their corresponding tariff intensities. For example, the household spending category for nonprescription drugs (UCC 550210) contains 133 HTS products, none of which was exposed to tariff increases in 2018–19. Therefore, the tariff intensity for this category is 0. As another example, the household spending category for watches (UCC 430110) contains 190 HTS products, 185 of which were targeted by tariff increases in 2018–19; thus, the corresponding tariff intensity is 185 / 190 = 0.97, indicating 97 percent of goods in that category were affected by tariffs.[7] If more products within an expenditure category are exposed to tariff increases, the tariff intensity measure for that category will rise.

Once we have a tariff intensity measure for each expenditure category, we then group these categories by tariff intensity to assess whether households have shifted their spending from categories that are more exposed to tariff hikes to categories that are less exposed to tariff hikes. Specifically, we combine all UCC expenditure categories into one of three groups: high intensity (categories with a tariff

Table 1

Examples of UCC Expenditure Categories and Corresponding HTS Products

UCC expenditure categories	Count of HTS products	Count of HTS products exposed to tariffs	Tariff intensity
Nonprescription drugs (550210)	133	0	0
Vitamin supplements (180720)	37	1	0.03
Office furniture for home use (320901)	19	3	0.16
Computers and computer hardware for nonbusiness use (690111)	167	35	0.21
Boys' suits, sport coats, vests (370311)	236	213	0.90
Other photographic supplies (610220)	72	66	0.92
Plumbing supplies and equipment (240311)	49	45	0.92
Jewelry (430120)	64	59	0.92
Global positioning system devices (600903)	14	13	0.93
Watches (430110)	190	185	0.97

Sources: U.S. International Trade Commission, Bureau of Labor Statistics (BLS), and authors' calculations.

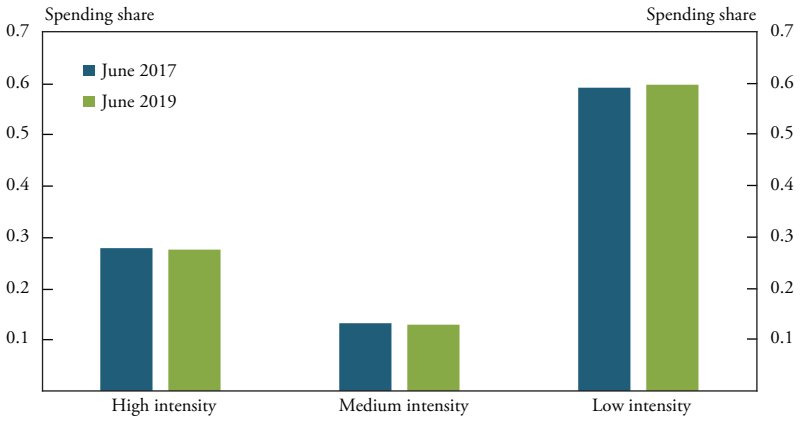
intensity above 0.9), medium intensity (categories with a tariff intensity from 0.1 to 0.9) and low intensity (categories with a tariff intensity below 0.1). The high-intensity group includes expenditures such as jewelry and some clothing, while the low-intensity group primarily contains health-care-related expenditures such as dental services and prescription drug insurance.

Chart 3 shows that the share of household spending in each group remained relatively stable from 2017 to 2019, suggesting households in the aggregate did not adjust their spending in response to the tariff increases. Indeed, the spending share for the high-intensity group and medium-intensity group dropped by only 0.2 and 0.3 percentage points, respectively, from June 2017 to June 2019, when most tariffs increases had been implemented. The spending share for the low-intensity group increased 0.4 percentage points over the same period.

Three factors could explain the relatively small shift from the high-intensity to low-intensity group. First, households may not have been able to substitute an expenditure in the high-intensity group with an expenditure in the low-intensity group, as the high-intensity group includes mainly goods, while the low-intensity group includes mainly services. Second, households may have taken more time to change their spending patterns than the relatively short window depicted in Chart 3. Third, the

Chart 3

Spending Share over Different Tariff-Intensity Categories: 2017 versus 2019



Sources: U.S. International Trade Commission, BLS, and authors' calculations.

pass-through of tariff increases to consumers may have been too small to generate a large substitution effect. Indeed, the latest available CEX data are from 2019, when some tariff hikes had just taken effect.

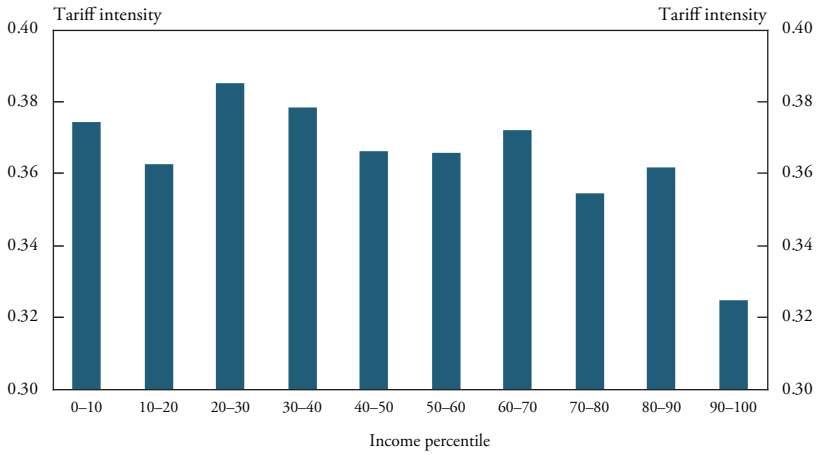
Did the tariff hikes affect certain types of households more than others?

In addition to evaluating whether households adjusted their spending in response to tariff hikes, we also use our tariff intensity measure to examine whether different types of households were more or less exposed to those hikes. Specifically, we calculate the tariff intensity for each household based on their spending distribution over different UCC expenditure categories. A household with a higher average tariff intensity devotes a larger share of their total spending to categories influenced by tariff increases.[8] We compare the tariff intensity levels for different households by income, age, and race and ethnicity.

We find that tariff intensity differs across these groups of households, suggesting some are more exposed to tariff hikes than others. Specifically, we find that low-income households are likely more exposed to tariffs. Chart 4 shows that tariff intensity in general declines with income levels. For example, the tariff intensity for households in

Chart 4

Tariff Intensity by Income Percentile



Sources: U.S. International Trade Commission, BLS, and authors' calculations.

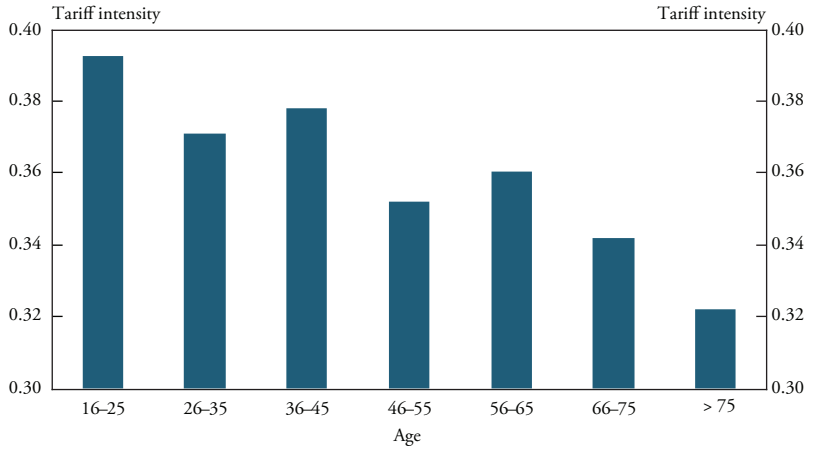
the 20th to 30th income percentiles is 0.06 (0.39 – 0.33) higher than for households in the 90th to 100th income percentiles. In other words, the share of spending on tariff-affected categories is 6 percentage points higher for households in the 20th to 30th income percentiles than for households in the 90th to 100th income percentiles. One main driver of this difference is that households with higher income spend relatively more on services, which are less exposed to tariffs.

We also find that tariff intensity declines with age. Chart 5 shows that younger households face a higher tariff intensity than older households. In particular, the tariff intensity for households age 16 to 25 is 0.39, while the tariff intensity for households age 75 and up is 0.32, suggesting that younger households are more exposed to tariffs than older households. This discrepancy reflects that younger households spend more on goods categories that experienced larger tariff increases, such as vehicle purchases and household furnishings and equipment.[9]

In addition, we find a relatively large difference in tariff intensity among different racial and ethnic groups. For example, Chart 6 shows that Black or African American households are more exposed to tariff increases than white households, while Asian households are less exposed. Similarly, Chart 7 shows that Hispanic or Latino households are more exposed to tariff hikes than non-Hispanic households.

Chart 5

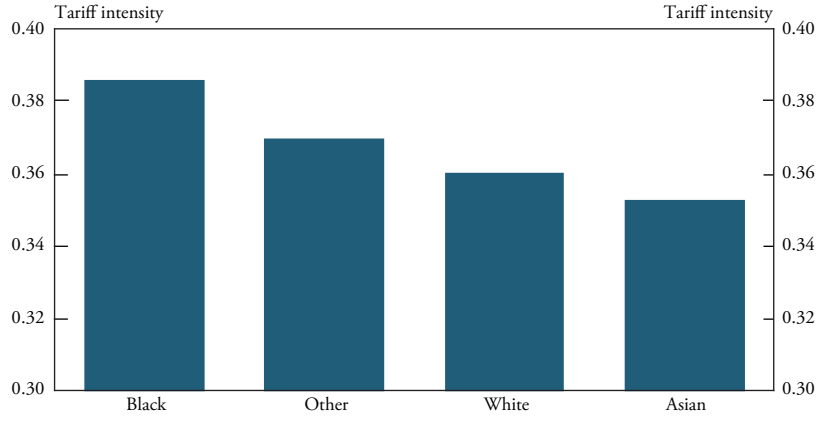
Tariff Intensity by Age Cohort



Sources: U.S. International Trade Commission, BLS, and authors' calculations.

Chart 6

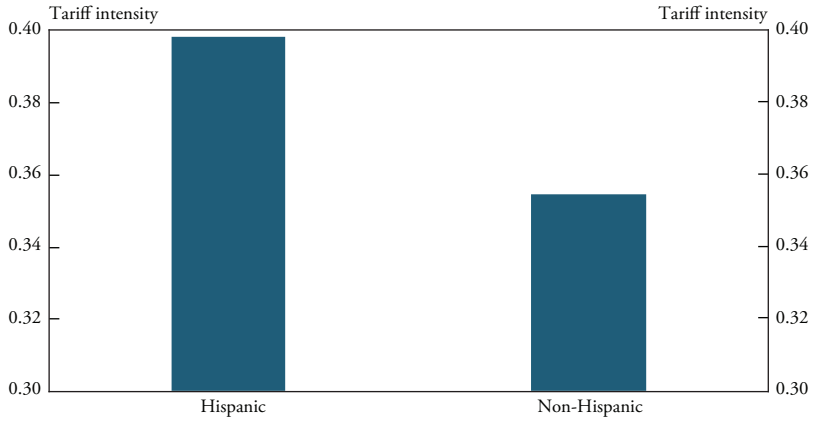
Tariff Intensity by Race



Note: The "Other" race category includes households who identified in the CEX as Native Americans, Pacific Islanders, or multi-racial.
Sources: U.S. International Trade Commission, BLS, and authors' calculations.

Chart 7

Tariff Intensity: Hispanic versus Non-Hispanic Households



Sources: U.S. International Trade Commission, BLS, and authors' calculations.

These differences are likely related to income differences across racial and ethnic groups. According to the CEX, in 2019, the average annual pre-tax household income of Black households was 34 percent lower than that of white households (including "other races") and 47 percent lower than that of Asian households, while the average income of Hispanic households was 25 percent lower than that of the non-Hispanic households. As discussed previously, higher-income households spend relatively more on services, which were not affected by tariff increases. Consistent with this interpretation, Black households had a 2 percentage point lower average annual share of spending on services than white households and a 3.7 percentage point lower share of spending on services than Asian households.[10]

Conclusions

The costs of the large-scale tariff increases in the United States during 2018–19 were largely passed through to U.S. importers and, to a lesser extent, consumers by the end of 2019. We construct a measure of households' exposure to these tariffs by matching detailed data on tariff-affected goods to household expenditure categories. By comparing expenditure shares in categories with different exposure to tariffs before and after the tariff increases, we show that households did not substantially alter their spending in response to tariff hikes by the end

of 2019—though this could change if the higher tariffs remain in effect longer and if retailers start to raise prices more on tariffed goods.

In addition, we show that the effects of the 2018–19 tariff hikes have been uneven across households of different ages, income levels, and racial and ethnic groups. In particular, we show that low-income households were more exposed to the tariff increases than high-income households, younger households were more exposed than older households, Black households were more exposed than white and Asian households, and Hispanic households were more exposed than non-Hispanic households. These findings suggest that researchers may need to take differences across demographic groups into account when evaluating the effects of tariff increases on the U.S. economy, as aggregate effects may underestimate the pass-through to certain U.S. households.

Endnotes

[1]Countries were given exemptions for various reasons, and some of these exemptions were temporary. Canada and Mexico were given exemptions because the countries were re-negotiating NAFTA. The European Union (EU) was given an exemption after retaliation threats, while Korea, Argentina, and Brazil were given permanent exemptions (but faced quotas). In June 2018, the exemptions ended for the EU, Canada, and Mexico.

[2]This level increased further in the fourth round of tariffs to nearly $115 billion; if the fifth round of tariffs had been implemented, the level would have reached more than $150 billion. These values are based on imports from China in 2017.

[3]Tariffs on imports from China have been largely unchanged since January 2020, though the expiration of some tariff exemptions may have slightly increased the realized tariffs on imports from China. In addition, due to the COVID-19 pandemic, the U.S. Trade Representative has exempted certain medical products from Section 301 tariffs since March 2020.

[4]When a government implements higher tariffs, it usually generates higher revenue if the quantities of imports do not decline too much. When the increased tariff revenue cannot cover the induced costs to importers and consumers, however, higher tariffs lead to a welfare loss to the home economy. In addition, higher tariffs can also lead to welfare losses to the economy targeted by tariffs, as they reduce total exports from the targeted economy and, accordingly, revenue.

[5]See the forthcoming Research Working Paper by Nie and Yang for more details.

[6]In calculating tariff intensity, we include the scheduled fifth round of tariff increases on imports from China. In a robustness check not included in this article, we show that excluding this round (which was not implemented due to the Phase One trade deal) does not change our main findings regarding differences in tariff exposure across groups of households, though it slightly lowers the tariff intensity level for an average household.

[7]Services are generally not exposed to tariffs, and the HTS codes do not include services. We therefore set the tariff intensity to be zero for UCC services categories.

[8]Our analysis focuses on how tariffs directly affect households through expenditures. However, tariffs may affect households through other channels, such as the income channel. For example, if higher costs due to higher tariffs cause firms to reduce hiring or wages, households' income will decline.

[9]In the first 11 months of 2019, younger households spent 18 percent of total expenditures on vehicle purchases and household furnishings and equipment, which is twice the share for older households.

[10]This calculation is based on aggregation at the UCC level. As all services categories have a tariff intensity of zero, and most goods categories have a positive tariff intensity, we use categories with zero tariff intensity as a proxy for services categories.

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Prepaid Cards: An Inadequate Solution for Digital Payments Inclusion

By Ying Lei Toh

Although the share of households without bank accounts has declined over time, about 7.1 million households remained unbanked in 2019. Unbanked households are less likely to be able to access digital or electronic payment methods, as owning a financial account—most commonly, a bank account—is a prerequisite for using credit and debit cards, receiving direct deposits through the Automated Clearing House (ACH), and making wire transfers. Although these households can still participate in many in-person transactions using cash or money orders, they are largely unable to participate in online and mobile transactions, which have become increasingly prevalent. Furthermore, digital payments exclusion may prevent unbanked households from participating in even in-person commerce as more businesses become cashless.

Digital payments exclusion—the inability to make or receive digital payments—is a form of financial exclusion that may threaten not only households' ability to participate in the digital economy but also their economic well-being. For instance, households excluded from digital payments received their COVID-19 Economic Impact Payments (EIP) via paper check at least six days later than households who received their EIP via direct deposit (Murphy 2021). Digital payments exclusion may

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also prevent unbanked households from benefitting from new payment services such as faster payments, which can help alleviate cash flow constraints (Greene, Hayashi, and Stavins 2020).

Payments researchers and industry advocates have proposed prepaid cards as a potential solution for addressing digital payments exclusion and improving unbanked households' access to financial services more generally (see, for example, Keitel 2010 and Hayashi 2016). Using prepaid cards, unbanked households can shop (both in person and online), receive their paychecks, pay bills, and make peer-to-peer (P2P) transfers. Moreover, prepaid cards are arguably the most accessible nonbank financial account option available to unbanked households because their use does not require internet access or other technologies.

In this article, I use data from the 2019 Federal Deposit Insurance Corporation (FDIC) Survey of Household Use of Banking and Financial Services to assess whether prepaid cards might improve digital payments inclusion among unbanked households. I find that unbanked households have low adoption rates of prepaid cards overall, though those who are age 25 to 44, white, employed, or have income between $30,000 and $75,000 are more likely to use prepaid cards. Given this low adoption rate, I assess the effectiveness of prepaid cards in addressing the barriers to bank account ownership commonly cited among unbanked households. I find that prepaid cards are more effective at addressing the barriers of high or unpredictable account fees and personal identification, credit, or former account problems, but less effective at overcoming the barriers of liquidity constraints, privacy concerns, and poor accessibility. My results suggest that prepaid cards are not a comprehensive solution to overcoming digital payments exclusion or common barriers to financial account ownership.

Section I provides a brief introduction to prepaid cards and discusses how they may offer a path to financial inclusion. Section II examines prepaid card adoption among unbanked households and shows that prepaid cards are unlikely to materially alter the financial exclusion rate. Section III identifies barriers to financial account ownership and shows that prepaid cards may not be able to adequately address some of these barriers.

I. Can Prepaid Cards Provide a Path to Financial Inclusion?

To make and receive digital payments, households must first have a financial transaction account. Most households use bank accounts for this purpose and can thus readily participate in digital payments. Unbanked households, in contrast, may be excluded from digital payments unless they have some alternative type of financial account, such as a neobank account, a prepaid card, or a cash balance or transaction account with a financial technology ("fintech") service provider (for example, a PayPal Cash account).[1]

Of these alternative financial accounts, prepaid cards are arguably the most accessible to unbanked households. To use accounts provided by fintech service providers and neobanks, unbanked households need access to an internet-capable device such as a mobile phone as well as an internet connection. In contrast, unbanked households do not need to own any technological devices to obtain and use prepaid cards for making in-person transactions and receiving digital payments. Thus, prepaid cards may be the easiest path to financial account ownership for unbanked households.

Prepaid cards, also known as prepaid debit cards or stored value cards, are preloaded with funds and can be used to conduct in-person, online, or mobile transactions. Common types of prepaid cards include general purpose reloadable (GPR) cards, which consumers may purchase for general use; payroll cards, which some employers offer to their workers as an option for receiving pay; government benefit cards, which government agencies use to pay out benefits (for example, unemployment insurance and the recent EIP); and gift cards, which consumers can buy for use at a specific retailer or set of retailers.[2] The features of prepaid cards vary by type, and some types are more suitable to function as transaction accounts than others. For example, some types of prepaid cards, such as gift cards, are closed-loop cards, meaning they can only be used at a specific retailer or set of retailers.[3] Moreover, gift cards are typically non-reloadable, and their funds cannot be transferred or withdrawn at an ATM. These usage requirements make gift cards less likely to foster digital payments inclusion among unbanked households.

In contrast, other types of prepaid cards, such as GPR, payroll, and government benefit cards, are typically open-loop cards, meaning they can be used at any location that accepts the card brand. In addition, GPR and payroll cards are typically reloadable by cardholders (and, in the case of payroll cards, their employers) and can be used to transfer funds and withdraw cash at ATMs. Although government benefit cards cannot be reloaded by cardholders, they may be reloaded by the issuing government agency. In addition, most government benefit cards allow for funds to be transferred or withdrawn at ATMs, though some, such as Electronic Benefit Transfer (EBT) cards, do not.[4]

Of these card types, GPR cards are arguably the most suited to serve as a transaction account for unbanked households. They are versatile and can be used to transfer funds and withdraw cash at ATMs. Although payroll cards offer similar features to GPR cards, unbanked households only have access to these cards if their employers offer them. In contrast, GPR cards are available for purchase at many retailers.

II. Prepaid Card Adoption among Unbanked Households

Prepaid cards have several features that appear to make them a strong candidate for promoting digital payments inclusion among unbanked households. However, the efficacy of prepaid cards in fostering digital payments inclusion will ultimately depend on whether unbanked households adopt and use them. The higher the share of prepaid card users among unbanked households, the larger the reduction in digital payments exclusion.

To examine unbanked households' adoption of prepaid cards, I use data from the 2019 FDIC Survey of Household Use of Banking and Financial Services. The first row of Table 1 shows that, according to the survey, only 27.7 percent of unbanked households use any type of prepaid card (excluding gift cards), implying that up to 3.9 percent (72.3 percent × 5.4 percent) of U.S. households may still lack a financial account.[5] Moreover, prepaid card adoption does not appear to have risen in recent years. Chart 1 shows that the share of prepaid card users has been relatively stagnant since 2015, even though the benefits of using prepaid cards have likely grown due to the expansion of digital commerce.

Table 1

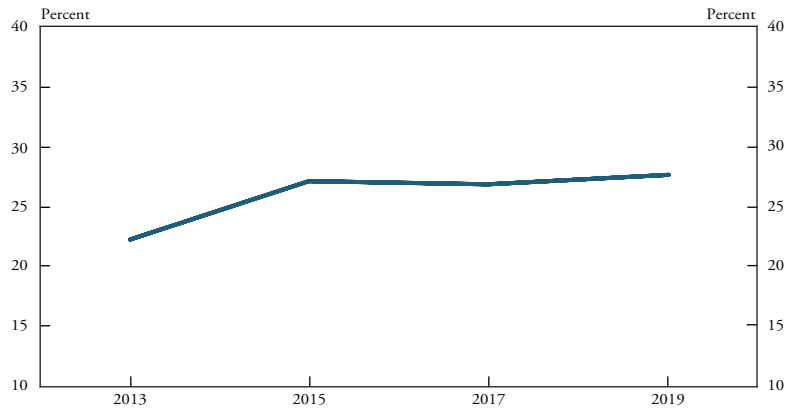
Unbanked Prepaid Card Adoption Rate, Unbanked Rate, and Digital Payments Exclusion Rate by Household Characteristic

Household characteristic	Unbanked prepaid card adoption rate (percent)	Unbanked rate (percent)	Digital payments exclusion rate (percent)
All	27.7	5.4	3.9
Income			
Under $30,000	26.6	15.9	11.7
$30,000 to $75,000	32.7	3.2	2.2
$75,000 and over	22.3	0.6	0.5
Education			
No high school diploma	22.3	21.4	16.6
High school diploma	31.8	6.0	4.1
College degree	17.7	0.8	0.7
Age			
15 to 24 years	29.7	8.8	6.2
25 to 44 years	34.6	6.6	4.3
45 to 64 years	26.9	5.3	3.9
65 years or more	11.2	3.3	2.9
Race and ethnicity			
Black	31.1	13.6	9.4
Hispanic	15.8	12.0	10.1
White	35.2	2.5	1.6
Other	28.0	3.6	2.6
Employment status			
Employed	34.0	3.6	2.4
Unemployed	30.2	13.2	9.2
Not in labor force	22.6	8.0	6.2
Metropolitan status			
Metropolitan area	26.1	5.4	4.0
Non-metropolitan area	28.6	6.2	4.4
Citizenship and place of birth			
U.S.-born	31.8	4.8	3.3
Foreign-born	14.5	8.4	7.2

Sources: FDIC and author's calculations.

Chart 1

Share of Prepaid Card Users among Unbanked Households, 2013–19



Source: FDIC.

Nonetheless, unbanked households were more than three times as likely to have used prepaid cards than banked households in the 2019 survey. The higher prepaid card adoption rate among unbanked households indicates that these households have more to gain from using prepaid cards than banked households, suggesting prepaid cards may still provide a modest benefit to digital payments inclusion.[6]

Moreover, although the adoption rate of prepaid cards is relatively low among unbanked households in the aggregate, some unbanked households may be more likely to use prepaid cards than others. Whether unbanked households find prepaid cards a feasible and desirable option may partly depend on their demographic and socioeconomic characteristics. Different types of households may prefer different types of payment methods—for example, older households may prefer cash or checks over payment cards—or different types of financial service providers. Additionally, some household types may have greater access to prepaid cards then others. For example, employed and unemployed households may be more likely to use prepaid cards than those who are neither working nor actively looking for work, as the former two groups may receive payroll cards and government benefit cards, respectively.

The first column of Table 1 shows that unbanked households' prepaid card adoption rates ranged from 11.2 percent to 35.2 percent

based on characteristic. The prepaid card adoption rate was relatively high (5 percentage points or more above the average of 22.7 percent) for unbanked households who were white (35.2 percent), from 25 to 44 years old (34.6 percent), employed (34 percent), or had annual income between $30,000 and $75,000 (32.7 percent). In contrast, the adoption rate was relatively low (5 percentage points or more below average) for unbanked households who were not in the labor force (22.6 percent), had an annual income of $75,000 and above (22.3 percent), had no high school diploma (22.3 percent), had a college degree (17.7 percent), were Hispanic (15.8 percent), were foreign-born (14.5 percent), or were 65 years or older (11.2 percent).[7]

Interestingly, many of the household types who were most likely to use prepaid cards conditional on being unbanked were also less likely to be unbanked (and hence excluded from digital payments) in the first place. The second column of Table 1 shows the unbanked rate by household characteristic. Among the four household types with relatively high prepaid card adoption rates, three types—white, income between $30,000 and $75,000, and employed—had unbanked rates of 3.6 percent or less. Conversely, some household types with relatively low prepaid card adoption rates had high or moderately high unbanked rates: for example, households without a high school diploma or that were Hispanic had unbanked rates of at least 12 percent, and households who were not in the labor force or were foreign-born had unbanked rates of at least 8 percent. In other words, many of the household types who were more likely to be unbanked were less likely to adopt them; consequently, the overall effect of prepaid cards on digital payments inclusion was small.[8]

The third column of Table 1 presents the proxy rates for digital payments exclusion (arising from a lack of financial account). In calculating these exclusion rates, I assume that households who lacked both bank and prepaid card accounts did not own other types of financial accounts; thus, these proxy rates provide the upper bounds of the true digital payments exclusion rates. The first row of the third column shows that prepaid card adoption reduced the overall digital payments exclusion rate by 1.5 percentage points, from 5.4 percent to 3.9 percent. The percentage point decline in digital payments exclusion by household type was the largest for household types with higher unbanked rates, despite some of

these households' lower tendency to use prepaid cards. In particular, prepaid card adoption reduced the digital payments exclusion rate by more than 4 percentage points for households who were Black, unemployed, did not have a high school diploma, or had income below $30,000.

Although household types with higher unbanked rates tended to experience larger reductions in their digital payments exclusion rate from prepaid card use, they continued to have the highest digital payments exclusion rates.[9] Furthermore, because of the "positive association" between unbanked rates and unbanked households' prepaid card adoption rates, prepaid card adoption widened many of the existing disparities in digital payments exclusion between households from different demographic or socioeconomic groups. Understanding why prepaid card adoption rates tend to be lower for households who were also more likely to be unbanked can help guide policies aimed at addressing these inequalities and improving access to digital payments.

III. Why Have Prepaid Cards Had a Limited Effect on Digital Payments Inclusion?

Although prepaid cards may benefit digital payments inclusion in theory, the previous section shows they provided a limited boost to financial account ownership among unbanked households in practice. One possible explanation for this limited boost is that unbanked households are simply not interested in having financial accounts. Another possible explanation is that the same barriers or concerns that prevent unbanked households from obtaining bank accounts also affect their adoption of prepaid cards.

Although the FDIC survey does not provide us with data on households' general interest in financial account ownership, it does offer information on the barriers to bank account ownership that unbanked households face. Specifically, the 2019 FDIC survey asked unbanked households to select one "main reason" for being unbanked from a list of possible reasons. These data allow me to calculate the prepaid card adoption rates among unbanked households facing each barrier. If unbanked households facing a certain barrier to bank account ownership have higher prepaid card adoption rates, then prepaid cards are likely to be effective in overcoming that barrier. However, if unbanked households facing a certain barrier have lower prepaid card adoption rates,

then prepaid cards may present the same barriers to account ownership as bank accounts.

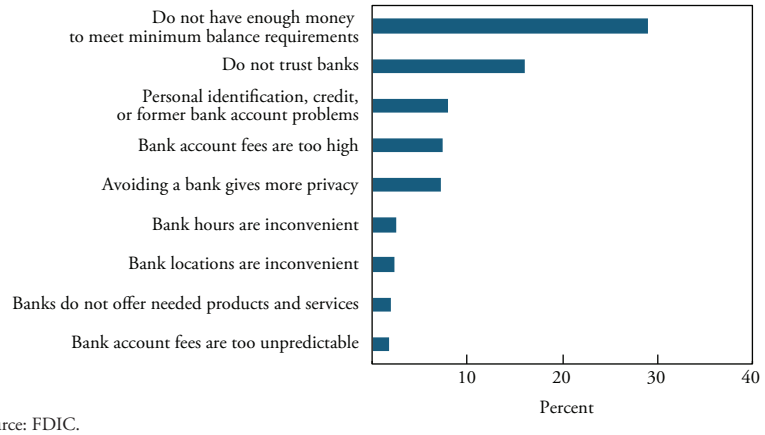
As a first step, Chart 2 shows the share of unbanked households who cited each of the reasons provided in the FDIC survey as their main reason for being unbanked. "Do not have enough money to meet minimum balance requirements" (29 percent) and "Do not trust banks" (16.1 percent) were the top two most-cited main reasons for being unbanked. Unbanked households were also considerably more likely to have cited "Personal identification, credit, or former bank account problems," "Bank account fees are too high," and "Avoiding a bank gives more privacy" as their main reason for being unbanked, relative to the other reasons provided.

To understand whether prepaid cards can overcome certain barriers to or concerns over bank account ownership, I next examine prepaid card adoption rates among households grouped by their main reason for being unbanked in the 2019 FDIC survey. Chart 3 shows the share of prepaid card users among unbanked households by the main reason they cited for being unbanked. The reasons are presented in descending order: the most cited reason appears at the top of the chart, while the least cited reason appears at the bottom. Comparing each bar with the bar labeled "All" highlights whether households struggling with a particular barrier were more or less likely to adopt prepaid cards than the average of all households. In this way, the chart highlights the relative strength of prepaid cards in overcoming common barriers to account ownership.

The most common main reason for being unbanked—an inability to meet minimum balance requirements—is associated with a lower rate of prepaid card use, suggesting prepaid cards may not be an effective method of digital payments inclusion for households facing liquidity constraints. This result may seem unintuitive, as prepaid cards, unlike many bank accounts, do not require users to hold a minimum balance on their cards. However, liquidity-constrained households may lack the incentives to adopt prepaid cards for a few reasons. First, liquidity-constrained unbanked households may prefer to receive their funds as soon as possible to cover bills and other liabilities; having funds direct-deposited onto a prepaid card may incur a delay relative to cash payments. Second, liquidity-constrained cardholders may be more likely to incur fees from prepaid cards. Many prepaid cards charge cardholders

Chart 2

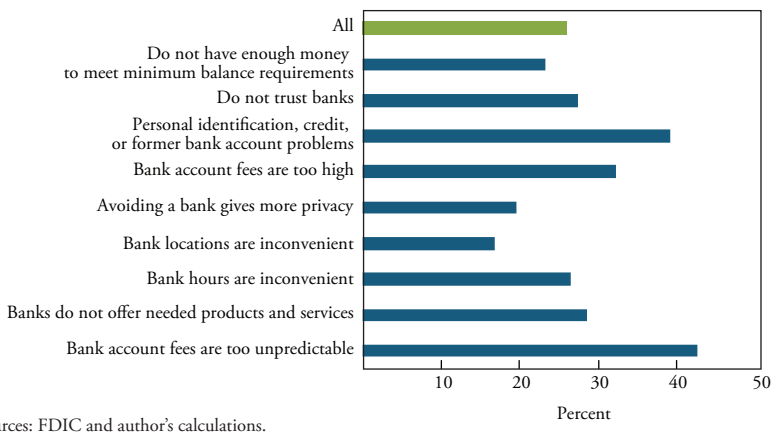
Main Reason for Being Unbanked (2019 FDIC Survey)



Source: FDIC.

Chart 3

Prepaid Card Adoption Rate of Unbanked Households by Main Reason for Being Unbanked



Sources: FDIC and author's calculations.

a monthly fee, which may be reduced or waived if the cardholders receive a sufficient value of direct deposits onto their cards each month. However, as liquidity-constrained households tend to prefer receiving payments in cash, they are less likely to be able to meet the minimum value of direct deposits. Third, liquidity-constrained unbanked households may not benefit from using a prepaid card as a cash storage tool. Liquidity-constrained households are likely to use up any cash they receive quickly, making the convenience of prepaid cards for cash storage less salient. For these households, the costs (both the hassle and fees) of using a prepaid card likely outweigh the benefits.

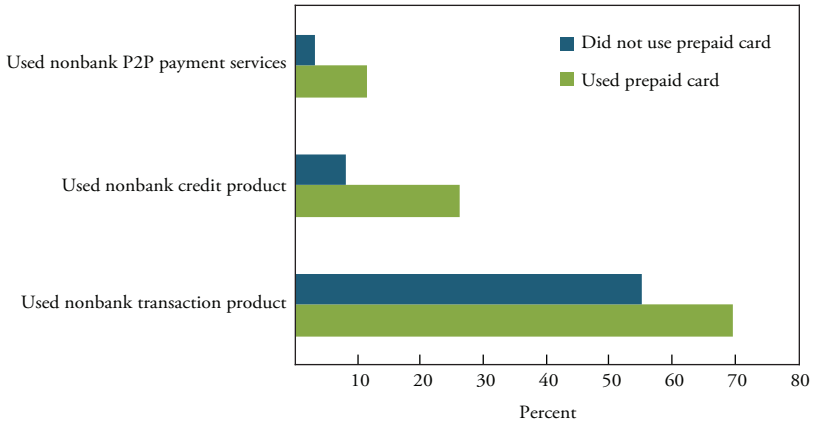
Households who cited the second most-common reason for being unbanked—"do not trust banks"—had a prepaid card adoption rate of 27.5 percent, which is close to the average rate for all unbanked households. This suggests that prepaid cards were not particularly effective at addressing the barrier of a lack of trust relative to other barriers. The limited boost in prepaid card adoption relative to the average rate may reflect that households distrust financial service providers more broadly—not just banks. Although some households who distrusted banks for specific reasons, such as past discriminatory practices, may consider prepaid card issuers to be more trustworthy, households whose distrust in banks is rooted in a deeper distrust of financial service providers in general are unlikely to place trust in prepaid card issuers, either.

To gain insight into whether households who do not use prepaid cards are also unlikely to use other types of financial services, I examine the use of nonbank transaction and credit financial services (for example, check cashing, nonbank money orders, payday loans, and title loans) and nonbank P2P payment services among households who cited a lack of trust in banks as their main reason for being unbanked. Chart 4 shows that among these households, those who did not use prepaid cards were also substantially less likely to have used other nonbank financial services and P2P payment services, suggesting they may distrust financial service providers in general.

The third most-cited main reason for being unbanked, "personal identification, credit, or former bank account problems," is associated with an above-average rate of prepaid card usage. Over 40 percent of households citing this reason used prepaid cards, suggesting prepaid cards were relatively effective at addressing these barriers to financial

Chart 4

Use of Nonbank Financial and P2P Payment Services among Unbanked Households Who Cited Lack of Trust in Banks as Main Reason for being Unbanked, by Prepaid Card Use



Note: Nonbank P2P payment services are conditional on having a smartphone or home internet.
Sources: FDIC and author's calculations.

account ownership. Prepaid cards were not equally effective at addressing all of the underlying barriers encompassed in this reason, however. In particular, prepaid cards were likely to have mostly helped with credit problems and former (bank) account problems rather than personal identification issues. Because prepaid card issuers do not require users to undergo credit checks or provide banking histories before obtaining a card, prepaid cards are likely to be a viable and desirable option for those who wish to obtain a bank account but were unable to do so because of credit or former bank account problems. But prepaid cards are unlikely to be a viable option for those with personal identification issues. The Customer Identitification Program (CIP) rule, which applies the requirements of Section 326 of the Patriot Act to prepaid cards, mandates GPR prepaid card issuers to verify the identity of cardholders if their cards are reloadable or offer credit or overdraft features (Board of Governors of the Federal Reserve and others 2016). The CIP rule also requires payroll card issuers and government benefits card issuers to verify the identity of cardholders if they are able to deposit money onto their cards; issuers are not required to verifiy cardholders' identities if the employer and the government, respectively, are the only entities able to load money onto the cards. As a result, only gift cards, government

benefit cards, and payroll cards that do not allow employees to load funds onto them would be accessible for unbanked households with personal identification issues. Moreover, among these cards, only gift cards are available to all households regardless of employment or income status—and gift cards offer few of the benefits of general use prepaid cards.

The fourth most-cited reason for not adopting a bank account, "bank fees are too high," is associated with a slightly above-average rate of prepaid card adoption. About one-third of households who cited this as their main reason for not owning a bank account used prepaid cards, suggesting prepaid cards were only marginally more effective in addressing this barrier relative to others. Whether or not prepaid cards are a cheaper alternative to bank accounts depends on the card type and how these households use their prepaid cards. Different types of prepaid cards charge different fees. For example, the EIP card only charges users for out-of-network and international withdrawals, whereas a typical GPR card also charges fees monthly or per transaction, and for ATM balance inquiry, customer service, and inactivity. Most reloadable prepaid cards also charge cash reload fees. The total cost of using a prepaid card may also vary depending on a household's ability to avoid the prepaid card fees and how they use their cards. For instance, households who receive their pay via direct deposit onto their prepaid cards may be able to avoid paying the monthly card fee, thereby incurring lower fees. Households who reload cash or withdraw cash from ATMs more frequently will tend to incur higher fees. On average, the cost of obtaining and using a prepaid card may be higher than that of a bank account. Hayashi and Cuddy (2014) estimate that GPR cardholders paid around $14 in card fees per month on average, which is higher than the monthly maintenance fees (for not meeting the minimum balance requirements) that some banks charge. A related study by Hayashi, Hanson, and Maniff (2015) finds that for consumers who do not use the overdraft or short-term credit facilities of checking accounts, GPR cards can be more costly than checking accounts.

Privacy concerns—the fifth most-cited main reason for being unbanked—are associated with a considerably below-average rate of prepaid card adoption. Less than 20 percent of households who cited privacy concerns as their main reason for being unbanked used prepaid cards. This result is not necessarily surprising: although some types of prepaid cards, particularly gift cards, may offer users greater anonymity

than bank cards, most types of prepaid cards are not anonymous. Payroll and government benefit cards, for example, are tied to the identity of the card recipients. And even though cardholders do not necessarily have to register their GPR cards and can use them anonymously, not registering their cards will likely restrict access to many features and protections offered by their prepaid card provider. For instance, GPR cardholders who do not register their cards may not be able to make ATM withdrawals or use their cards for online transactions; moreover, they may not be offered protection against errors, loss, or theft (Consumer Financial Protection Bureau 2019). The prepaid cards that do offer households the ability to transact anonymously may provide little to no advantage over cash for households who highly value the privacy of their transactions.

The last four reasons were cited by relatively small shares of unbanked households—under 2.5 percent each. Households who cited inconvenient bank locations or bank hours as their main reason for being unbanked were not more likely to use prepaid cards than the average unbanked household. This result is somewhat surprising, as it suggests that these unbanked households did not find using prepaid cards to be more convenient. Households who cited inconvenient bank locations as their main reason for being unbanked were particularly unlikely to use prepaid cards, despite the widespread availability of prepaid cards at retail stores. One possible explanation is that the results are driven by idiosyncratic household preferences and may not be representative, as the shares of households who cited inconvenient bank hours and locations were relatively small. Households who cited a mismatch between the products offered by banks and those they desired were slightly more likely than the average household to use prepaid cards, suggesting that prepaid cards may be somewhat more effective at addressing this mismatch relative to other barriers. Finally, households who were unbanked mainly because they found bank account fees to be unpredictable were substantially more likely than average to use prepaid cards. The Consumer Financial Protection Bureau prepaid card rule, which requires clear, upfront disclosures of card fees, likely helps to explain why prepaid cards are relatively effective at addressing the barrier of unpredictable fees (Consumer Financial Protection Bureau 2016).

In sum, unbanked households who cited "bank account fees are too unpredictable," "personal identification, credit, or former bank account

problems," or "bank account fees are too high" as their main reason for being unbanked had substantially higher adoption rates of prepaid cards than the average for all unbanked households, suggesting that these households perceived prepaid cards to be more viable or desirable than bank accounts. Those who cited "banks do not offer needed products and services," "bank hours are inconvenient," or "do not trust banks" also adopted prepaid cards at slightly higher rates than the average of all unbanked households. Finally, those who cited "do not have enough money to meet minimum balance requirements," "avoiding banks gives more privacy," or "bank locations are inconvenient" adopted prepaid cards at a lower-than-average rate, suggesting prepaid cards were unable to overcome these barriers to account ownership.

The above analysis provides insights into why prepaid cards have had a limited effect on increasing financial account ownership—and thus improving digital payments inclusion—among the unbanked. Although prepaid cards have helped some unbanked households overcome barriers to financial account ownership, they were largely inadequate for doing so for a majority of unbanked households. Notably, prepaid cards were relatively ineffective at addressing liquidity-constraint issues, the barrier affecting the largest share of unbanked households.

The case of prepaid cards illustrates how promoting digital payments inclusion among unbanked households is challenging. Unbanked households are not a monolith, and they may face an array of barriers to financial account ownership, ranging from the lack of liquidity to personal identification and credit problems to lack of trust in financial institutions and privacy concerns. Many of these barriers are likely to also affect households' adoption of other types of financial accounts, such as fintech and neobank accounts.

Conclusion

Although prepaid cards can offer unbanked households a path to digital payments inclusion, their adoption rate has been low among unbanked households thus far. Moreover, the household types that were more likely to be unbanked (in 2019) also tended to have lower prepaid card adoption rates conditional on being unbanked, suggesting that many of the same factors that discouraged these households from opening bank accounts—including liquidity constraints, privacy concerns,

a lack of trust in financial institutions, and personal identification issues—may also prevent or discourage households from adopting prepaid cards.

The adoption rates presented in this article were collected in 2019, and more recent developments may have made prepaid cards more attractive to unbanked households. For example, regulations aimed at increasing the transparency of prepaid card fees may help increase prepaid card adoption among the unbanked. The COVID-19 pandemic may also encourage prepaid card adoption. Many households likely used prepaid cards for the first time when receiving their EIPs; if these households had a positive experience with the cards, they may choose to start using them more broadly in the future. The potential availability of faster payments via prepaid cards may also boost prepaid card adoption by helping to alleviate liquidity constraints.

However, high prepaid card fees may present an ongoing challenge to prepaid card adoption, and if the fees and features of prepaid cards remain unchanged, the role of prepaid cards as a means for achieving digital payments inclusion will likely diminish. Balance accounts offered by fintechs (such as PayPal and Square) and neobanks (notably Chime) are quickly gaining popularity among U.S. consumers, particularly younger consumers (Shevlin 2021). In addition, the Infrastructure Investment and Jobs Act currently under consideration in Congress seeks to provide $65 billion of investment in broadband infrastructure to improve households' broadband internet access, particularly among those in lower-income groups. If implemented, this infrastructure plan will likely further boost the adoption of fintech alternatives. Policymakers are also considering public banking options, including digital currency accounts with the Federal Reserve and postal banking, as alternative means of reaching the unbanked. These fintech alternatives and potential public banking options are likely to appeal to a wider population of unbanked households as they come with lower fees and do not have minimum balance requirements. Moreover, competition from fintech firms and, potentially, the government may spur banks to better cater their products and services to the needs of the unbanked, further reducing the appeal of prepaid cards.

Endnotes

[1]Neobanks are fintechs that partner with a bank to offer bank-like services to consumers via digital interfaces such mobile apps (Bradford 2020). Typically, accounts offered by neobanks are FDIC-insured.

[2]Data published by the Treasury show that over 16 million EIP prepaid cards were distributed across the three EIPs.

[3]Open-loop prepaid gift cards exist but are less common.

[4]EBT cards are open-loop in the sense that they do not restrict where cardholders can shop; however, they restrict the categories of purchases that the cards can be used for.

[5]The FDIC survey excludes gift cards from its definition of prepaid cards. Although it is possible that unbanked households without prepaid cards may own other types of financial accounts, this is unlikely, as the alternatives typically require unbanked households to have an internet connection and a device for using the internet, which most unbanked households did not have.

[6]Banked households already have access to these benefits via their bank account and thus have less to gain from using prepaid cards.

[7]An attentive reader may notice that prepaid card adoption rates do not exhibit a straight-line relationship with many of the demographic and social economic variables, including age, income, and education. For instance, households with the highest and lowest levels of formal educational attainment had lower prepaid card adoption rates than those with educational attainment between. These non-straight-line relationships suggest that unbanked households' decisions to adopt prepaid cards were affected by multiple, possibly opposing factors.

[8]For instance, a 20 percent prepaid card adoption rate would lower households' digital payments exclusion rate by 2 percentage points if the unbanked rate were 10 percent but only 1 percentage point if the unbanked rate were 5 percent.

[9]The main reason for the relatively large percentage point declines in digital payments exclusion rates for these households was their substantially higher unbanked rates, which overcompensated for their relatively low prepaid card adoption rates.

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How the Pandemic Influenced Trends in Domestic Migration across U.S. Urban Areas

By Jason P. Brown and Colton Tousey

In the years leading up to the COVID-19 pandemic, net domestic migration in the United States was generally increasing in smaller urban areas while declining in the largest urban areas. The pandemic may have accelerated this trend: business restrictions to slow the spread of the virus were more intense in larger urban areas, where population density was higher and economic activity was more service based. As a result, more people may have chosen to leave these areas to mitigate their exposure to COVID-19 or avoid stricter lockdown measures.

Changes in domestic migration trends may influence the longer-term growth prospects of places. For example, urban areas with higher net domestic migration tend to grow faster because more people generate greater demand for goods and services. However, investigating recent trends in domestic migration can be challenging because data releases from official government sources are released with a long lag—often a year or more.

One way to overcome this lag is by using higher frequency information on address changes self-reported by consumers. The credit rating agency Equifax, for example, collects data on consumer address changes monthly. We use these data to assess whether domestic migration between urban areas changed after the onset of the pandemic. We find that the rate of net domestic migration increased further in small and

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medium urban areas and declined further in very large urban areas. Moreover, the relationship between net domestic migration and two of its historical driving factors—population density and natural amenities—diminished only slightly during the pandemic. Our findings suggest that though the pandemic influenced net domestic migration, it has not yet drastically altered migration trends to less crowded urban areas with higher natural amenities.

Section I documents the trends in U.S. domestic migration by urban area before and during the pandemic. Section II estimates the relationship between historical factors driving migration and shows that those factors have not materially changed in importance during the pandemic.

I. Trends in Urban Domestic Migration

Measures of domestic migration often distinguish between moves within the same urban area and moves to different areas. The reason for this distinction is that moves within the same urban area are more likely to be housing-related, while moves to another area are more likely to be job-related (Frey 2019). Recent studies on migration within urban areas, for example, tend to emphasize differences in housing prices and rent in the urban core versus in the suburbs (Gupta and others 2021; Ramani and Bloom 2021). In this article, we focus on domestic migration between urban areas because these moves are more likely to be job- or pandemic-related. Moreover, moves between urban areas are more likely to represent longer-term changes in domestic migration.

The largest challenge in measuring domestic migration between urban areas close to the timing of an event, such as the pandemic, is data availability. Most measures of domestic migration are released with a multi-year lag and typically have limited geographical coverage. For example, the American Community Survey (ACS) releases migration data annually with at least a one-year lag; however, movement at the county level is only available over a five-year window. Although the Internal Revenue Service (IRS) Statistics of Income (SOI) capture county-to-county migration, SOI data, too, are released with a long lag and currently only available through 2018.

One possible solution is to use higher-frequency data from credit bureaus, which track not only individuals' debt but also their general location. When people move, they typically update their address with

financial institutions shortly thereafter, and credit rating agencies such as Equifax include these address changes in their data collection process. Recent work by DeWaard, Johnson, and Whitaker (2018) shows that one such data source, the Federal Reserve Bank of New York Consumer Credit Panel/Equifax (CCP), is comparable—and in some ways superior—to standard data used to study migration. One major advantage of the CCP is the frequency and timeliness of the data: the CCP is released quarterly about one month after the end of the quarter. Another advantage is the spatial disaggregation available in the CCP, which captures moves between counties and even between census block groups. One disadvantage, however, is that our measures may not capture moves of individuals without access to credit markets—typically, lower-income individuals (Wardrip and Hunt 2013; DeWaard, Johnson, and Whitaker 2018).

We use the CCP to measure migration between different urban areas. The CCP is a nationally representative anonymous random sample from Equifax credit files that tracks the credit use and address of approximately 12 million individuals at a quarterly frequency. We use the CCP county information and group counties into urban areas known as core-based statistical areas (CBSAs).[1] The U.S. Census Bureau defines CBSAs as either micropolitan or metropolitan depending on the population of urban areas within each county and neighboring counties. Constructing county tabulations allows us to show domestic migration from the smallest to the largest urban areas in the country. We label CBSAs as "small urban" (fewer than 220,000 people, such as Shawnee, OK), "medium urban" (220,000 to <1 million people, such as Omaha-Council Bluffs, NE-IA), "large urban" (1 to <4 million people, such as Kansas City, MO-KS), or "very large urban" (4 million or more people, such as Chicago-Naperville-Elgin, IL-IN-WI). Table 1 reports summary statistics of the assigned groups measured in 2019. Most of the CBSAs in the sample are small urban areas, with populations ranging from 13,000 to 219,000. Although the U.S. Census Bureau has no official definition of rural areas, many of these small urban areas could be considered rural in nature.

We calculate entry, exit, and net migration rates for 883 urban areas using quarterly data from the CCP.[2] When measuring migration, by definition, an entry into one urban area is an exit for another. Entry

Table 1
Population of Urban Areas in 2019

Urban area	Number	Population		
		Minimum	Maximum	Median
Small urban	720	12,728	219,186	54,399
Medium urban	154	220,411	999,101	417,345
Large urban	39	1,047,279	3,979,845	2,048,449
Very large urban	14	4,319,629	19,216,182	6,134,461

Sources: U.S. Census Bureau and authors' calculations.

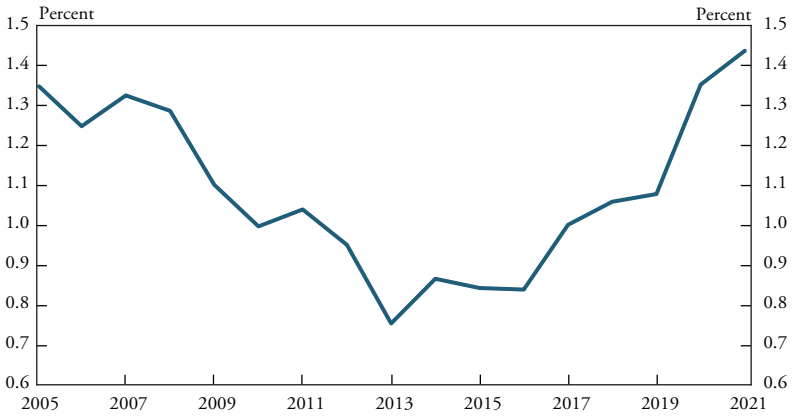
and exit rates capture the overall turnover in people (Brown and Tousey 2020). Net migration rates measure the difference between entry and exit rates: if the net migration rate is positive for a given urban area, that area has experienced population gains from domestic migration. Net migration rates also capture potential shifts in peoples' location preferences rather than movements related to life-cycle events such as marriage or retirement.

Chart 1 shows that the U.S. gross migration rate—that is, the overall propensity for people to move between urban areas—was in decline until 2013 but has since reversed course. Our measure of migration across all urban areas shows that about 1.3 percent of people moved annually to another urban area in the mid-2000s. This rate then fell by nearly half, bottoming out in 2013. Since then, the rate of domestic migration has steadily risen to a little above 1.4 percent as of 2021:Q1. This steady increase is notable because cross-state measures of domestic migration from the U.S. Census Bureau show a relatively flat rate from 2015 to 2019. One possible explanation for the difference between measures is that the CCP captures people who move to different urban areas within the same state as well as those who move to different states. Another possible explanation for the difference is that people with a credit history, who are therefore captured in the CCP, may be more likely to move.

The recent increase in domestic migration reflects an increase in both entry and exit rates across urban areas, regardless of size. Panels A and B of Chart 2 show the entry and exit rates, respectively, by urban area size from 2015 to 2021.[3] During that time, the entry and exit rates for both small and medium urban areas increased from about 0.9 to 1.7 percent. In addition, the chart shows that entry and exit rates in small

Chart 1

Aggregate Gross Migration between Urban Areas



Sources: Federal Reserve Bank of New York Consumer Credit Panel/Equifax and U.S. Census Bureau.

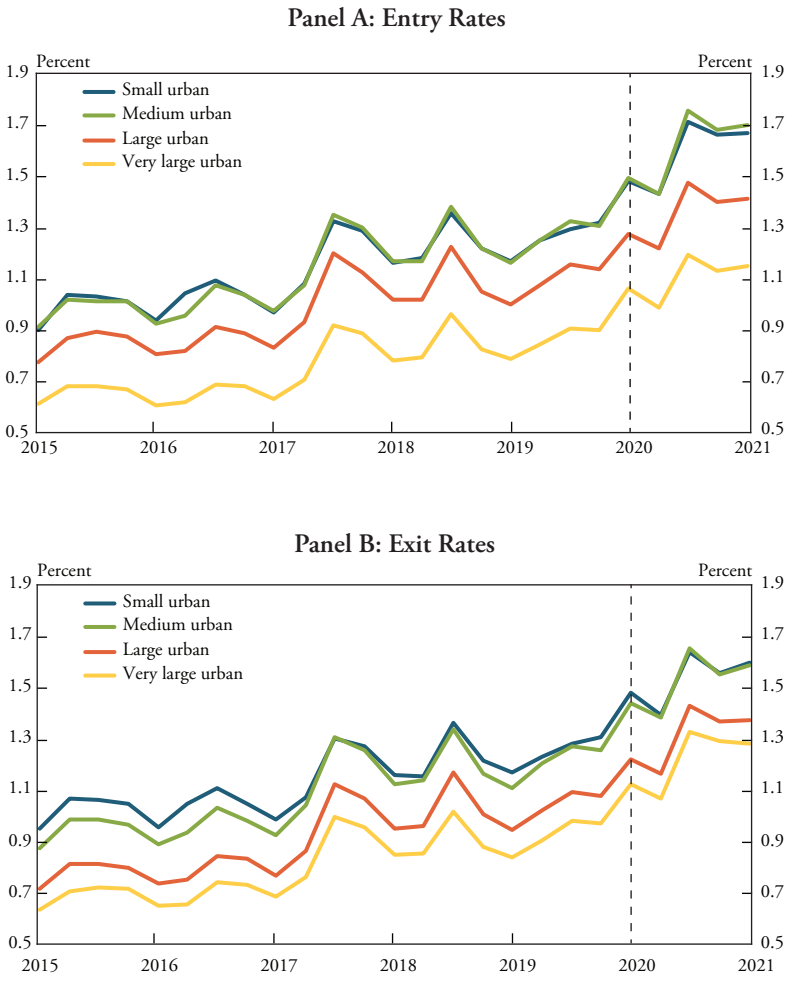
and medium urban areas have been persistently higher than in large and very large urban areas. In general, entry and exit rates tend to move together within a given urban area, making them highly correlated with each other. In other words, places with a higher entry rate tend to also have a higher exit rate.

Despite increased entry and exit rates, not all urban areas had net migration (and therefore population) gains. Chart 3 shows that the net gains from domestic migration have changed over time across urban areas of various size. Although medium and large urban areas (green and orange lines) had positive net migration throughout the entire 2015–21 period, small areas (blue line) experienced either net losses or no net gains prior to 2020. Similarly, very large urban areas (yellow line) consistently lost people on net. Our findings are consistent with Rappaport (2018), who shows that large—but not the largest—urban areas have experienced faster population growth over the past two decades.

The general rate of domestic migration between urban areas increased further after the onset of the COVID-19 pandemic, but not all urban areas experienced a net increase. For comparison, we define the pre-pandemic period as 2019:Q2–2020:Q1 and the pandemic period as 2020:Q2–2021:Q1 based on data availability. The first data column of Table 2 shows that in the pre-pandemic period, small, medium, and large urban areas had positive net domestic migration. In contrast, large

Chart 2

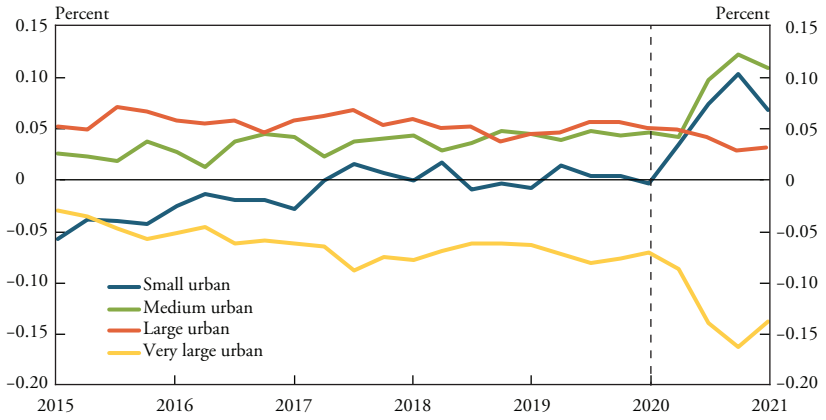
Urban Area Domestic Migration Rates



Note: Dashed vertical line represents the start of the pandemic in 2020:Q1, when the national emergency was declared.
Sources: Federal Reserve Bank of New York Consumer Credit Panel/Equifax, U.S. Census Bureau, and authors' calculations.

Chart 3

Urban Area Net Domestic Migration Rates



Note: Dashed vertical line represents the start of the pandemic in 2020:Q1, when the national emergency was declared.
Sources: Federal Reserve Bank of New York Consumer Credit Panel/Equifax, U.S. Census Bureau, and authors' calculations.

Table 2

Net Domestic Migration Rates, Pre-pandemic (2019:Q2–2020:Q1) versus Pandemic (2020:Q2–2021:Q1)

Urban area	Pre-pandemic (percent)	Pandemic (percent)	Change in net rate (percentage point)	Change in entry rate (percentage point)	Change in exit rate (percentage point)
Small urban	0.005	0.071	0.066	0.286	0.220
Medium urban	0.045	0.093	0.049	0.299	0.250
Large urban	0.053	0.038	−0.015	0.215	0.229
Very large urban	−0.079	−0.132	−0.053	0.154	0.207

Sources: Federal Reserve Bank of New York Consumer Credit Panel/Equifax, U.S. Census Bureau, and authors' calculations.

urban areas on average had negative net domestic migration, indicating more people were moving out of them. The second and third columns of Table 2 show that after the onset of the pandemic, net domestic migration increased further in small and medium urban areas, but declined slightly in large urban areas. In very large urban areas, the decline was much larger; in fact, in these areas, net migration turned further negative, on average. Finally, the fourth and fifth columns in Table 2 show that small and medium urban areas saw larger gains in entry rates than exit rates. Conversely, in large and very large urban areas, exit rates increased by more than entry rates during the pandemic.

Although changes in net domestic migration rates show which urban areas gained more people, net changes mask the underlying dynamics of moves between urban areas of different size. For example, even though *total* net migration to large urban areas decreased during the pandemic, net migration from very large to large urban areas may have increased (and been offset by decreases in net migration from small and medium urban areas). To account for these potentially different dynamics, Table 3 reports the change in net domestic migration by origin-destination pairs by urban area size between the pre-pandemic and pandemic periods.[4] In other words, Table 3 decomposes the change in the total net migration rate reported in Table 2 into the change in migration rates *from* each size of urban area *to* each size of urban area. Thus, the sum of the rows for a given column in Table 3 correspond to the number in the third column of Table 2.

Overall, the decomposition suggests that people left larger urban areas for smaller urban areas during the pandemic. The negative signs on the values in Table 3 show that net domestic migration from small and medium urban areas to large and very large urban areas decreased across the board. This indicates that on net, fewer people have moved to larger urban areas since the pandemic. At the same time, net domestic migration from larger to smaller urban areas increased. For example, net domestic migration from medium to small urban areas increased by 0.017 percentage points, and net migration from very large to medium urban areas increased by 0.039 percentage points. Although Chart 3 shows that net migration to medium urban areas increased during the pandemic, Table 3 highlights that these additional gains came from large (0.023 percentage points) and very large (0.039 percentage

Table 3

Change in Net Migration Rate by Origin-Destination Type, Pre-pandemic versus Pandemic

Origin	Destination			
	Small urban (percentage point)	Medium urban (percentage point)	Large urban (percentage point)	Very large urban (percentage point)
Small urban	–	–0.012	–0.013	–0.014
Medium urban	0.017	–	–0.021	–0.028
Large urban	0.020	0.023	–	–0.015
Very large urban	0.028	0.039	0.020	–

Sources: Federal Reserve Bank of New York Consumer Credit Panel/Equifax and authors' calculations.

points) areas, and not from small urban areas. Overall, the recent trend in the size of areas people have moved to and from has continued and perhaps even strengthened since the pandemic.

Our findings support other recent research documenting an "exodus" from larger cities during the pandemic. Haslag and Weagley (2021) and Whitaker (2021a, 2021b) both find a shift in migration away from larger urban areas into smaller cities during the pandemic. Haslag and Weagley (2021) estimate that 10 to 20 percent of moves from April 2020 to February 2021 were influenced by COVID-19. Additionally, they note that the moves were to smaller cities, areas with a lower cost of living, and areas with fewer pandemic-related restrictions.

II. Factors Influencing Domestic Migration between Urban Areas

The initial acceleration in domestic migration trends during the pandemic raises the question of whether the factors that have historically influenced domestic migration have also changed. From the summer of 2020 to the summer of 2021, various news outlets reported on "pandemic pilgrims" leaving big cities for less crowded areas (Mull 2020; Patino, Kessler, and Holder 2021; Walters 2021). Although most news coverage cited concerns of COVID-19 as the main factor behind these moves, many stories also mentioned the congestion and high cost of living in large urban areas. Another potential factor behind these moves was the greater prevalence of remote work during the pandemic (Dingle and Neiman 2020). This shift toward remote or partially remote work may have given people more flex-

ibility to maintain their jobs while living in more desirable areas, such as places with more natural amenities and outdoor activities that could offer an escape from pandemic life—provided these areas also have sufficient internet connectivity for remote work.

Preferences for where people want to live are often measured using local factors that capture characteristics of the area (Tiebout 1956). Typically, these factors are grouped into broad categories related to earnings potential, infrastructure, and natural amenities (Banzhaf and Walsh 2008). Previous research has documented that the average productivity of workers and wages are higher in larger urban areas, which tend to attract more workers and more economic activity in general (Glaeser and Saiz 2004; Henderson 2007; Glaeser 2011; Morreti 2012). Areas with better internet infrastructure also tend to grow faster (Kolko 2012). In addition, areas with higher natural amenities tend to attract more people over time (Rappaport 2007; McGranahan, Wojan, and Lambert 2011).

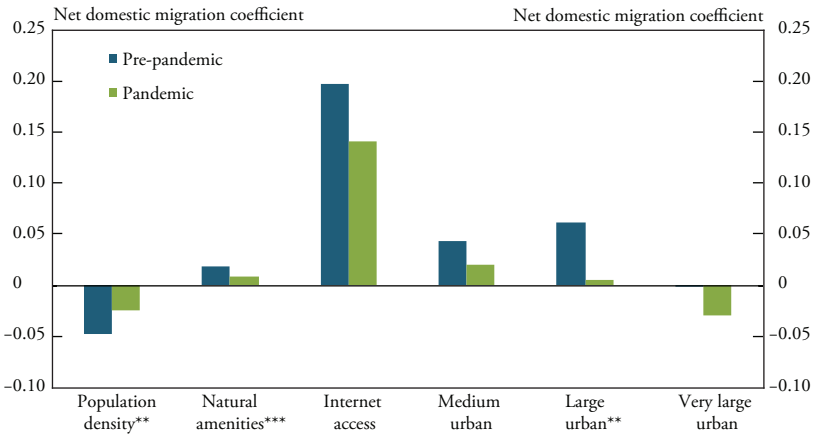
We test whether local factors that influence domestic migration have changed in importance during the pandemic. Specifically, we estimate the relationship between average net domestic migration and local factors in each urban area during the pre-pandemic and pandemic period. Descriptive statistics of these measures are provided in Table A-1 of the appendix, as are details of the econometric model.

We find that local factors that explain variation in net domestic migration between urban areas did not drastically change between the pre-pandemic and pandemic period, except for urban size. Chart 4 shows our estimation results for each factor during the pre-pandemic and pandemic periods. Overall, our results are consistent with previous findings on the determinants of domestic migration.

Comparing the blue and green bars in Chart 4 shows that population density has become marginally less important to migration during the pandemic. During the pre-pandemic period, population density is negatively correlated with net domestic migration. A 1 percent increase in an urban area's 90th percentile density is correlated with a 0.05 percentage point decrease in net migration, suggesting increased congestion costs in the densest portion of urban areas discourage people from moving there. Although congestion continued to weigh on migration during the pandemic, the effect was slightly weaker (–0.02

Chart 4

Differences in Urban Area Net Domestic Migration Coefficients, Pre-pandemic versus Pandemic



* Statistically different at the 10 percent level
** Statistically different at the 5 percent level
*** Statistically different at the 1 percent level

Sources: Federal Reserve Bank of New York Consumer Credit Panel/Equifax, U.S. Census Bureau, and authors' calculations.

versus –0.05). This weakening suggests that congestion costs may have been slightly lower during the initial stages of the pandemic as people either left crowded areas or spent more time at home.

Surprisingly, natural amenities also appear to have become somewhat less important to migration during the pandemic. During the pre-pandemic period, a one-unit change in the natural amenities index is correlated with a 0.02 percentage point increase in net migration. However, during the pandemic, the marginal increase in net migration is only 0.01. If areas with higher natural amenities had become more attractive during the pandemic, we would expect to see an increase in this correlation, not a decrease.

Greater internet access is also correlated with higher net domestic migration, and this correlation has been stable across the two time periods. In the pre-pandemic period, a 1 percent increase in the share of households with a high-speed internet connection is correlated with a 0.20 percentage point increase in net migration. The marginal response is slightly weaker in the pandemic period (0.15 versus 0.20), but the

difference is not statistically significant. Although internet access was undoubtedly important for remote work and schooling during the pandemic, it does not appear to have become more important to migration.

In contrast, urban size became substantially more important to net migration in the pandemic period. During the pre-pandemic period, medium and large urban areas had 0.06 percentage point higher net migration than small urban areas. However, during the pandemic, this gap shrunk substantially to 0.01 percentage point. This relative reduction is consistent with people moving to smaller areas during the pandemic, which suggests more people may have chosen to move to small over medium and large urban areas during the pandemic.

Our findings suggest that though the pandemic has influenced domestic migration patterns, the factors driving net migration between urban areas have not appreciably changed thus far. Migration to smaller urban areas ticked up slightly during the pandemic, but it is too early to tell whether this shift is permanent. The general disruption created by the pandemic may have led people to leave larger, more dense urban areas at a higher rate, but the gains of living and working in larger urban areas will likely not disappear. A large portion of economic activity, especially in the service sector, is increasingly based on knowledge, idea exchange, and agglomeration, all of which are more highly concentrated in larger urban areas (Moretti 2012). These benefits will likely continue to attract more workers and therefore more people to large urban areas. However, people may also pursue more flexible work arrangements that allow them to choose a less crowded area in which to live.

Conclusion

Prior to the pandemic, net domestic migration in the United States had been increasing in smaller urban areas while declining in larger urban areas. The biggest factor pushing people away from the largest urban areas was likely a higher cost of living. Small and medium urban areas were net beneficiaries, as more people moved to places that had less congestion but the employment opportunities and amenities they desired.

The disruptions of the pandemic appear to have accelerated these trends. Overall movement between urban areas actually increased during the pandemic, though not all areas experienced a net increase in migration. The largest net gains occurred in small and medium urban

areas at the expense of very large urban areas, indicating people left these areas at an even higher rate.

Despite increasing migration out of the largest urban areas, the factors that help explain differences in net migration between urban areas did not change much during the initial quarters of the pandemic. As a result, trends in domestic migration between areas will likely revert to previous trends as the pandemic fades. Given the growing importance of knowledge-based service sectors in larger urban areas, it will be difficult for small urban areas to continue to have larger net gains in migration. That equilibrium will likely be determined by the advantages of more flexible work arrangements versus higher labor productivity in larger urban areas.

Appendix

Estimating the Relationship between Urban Area Characteristics and Net Migration

We estimate the relationship between average net domestic migration y in urban area i and local factors in each urban area for the pre-pandemic and pandemic period using a repeated cross-section. All local factors are measured before the pandemic and are held constant in our analysis. Population density, which captures potential congestion costs, is measured using 2010 census data in log terms at the 90th percentile of density in an urban area as experienced by people. The measure of natural amenities is the average indexed value of natural amenities across all counties in an urban area from U.S. Department of Agriculture's Economic Research Service (USDA ERS) based on 2000 data. A higher index value indicates areas with more natural amenities. Internet access is a proxy for local infrastructure and is measured using the share of households in an urban area that had access to a high-speed internet connection in 2016 from the Federal Communications Commission. We measure urban size using an indicator variable for medium, large, and very large urban areas using the previously defined population thresholds.[5] Descriptive statistics of these measures are reported in Table A-1.

For each period (pre-pandemic versus pandemic), the average net domestic migration for each urban area is used as the dependent variable in the following model:

$$y_{it} = \alpha + \beta_1 pop\ dens + \beta_2 natural\ amenities + \beta_3 internet\ access + \beta_4 medium\ urban + \beta_5 large\ urban + \beta_6 very\ large\ urban + \gamma_0 pandemic + \gamma_1 pandemic \times pop\ dens + \gamma_2 pandemic \times natural\ amenities + \gamma_3 pandemic \times internet\ access + \gamma_4 pandemic \times medium\ urban + \gamma_5 pandemic \times large\ urban + \gamma_6 pandemic \times very\ large\ urban + \varepsilon_{it}.$$

We control for urban area population density at the 90th percentile in log scale, natural amenities, internet access, and size indicators of urban areas based upon population thresholds previously discussed. The pandemic indicator and its interaction with each factor allow us to test

Table A-1
Sample Urban Area Descriptive Statistics

Net migration and local factors	Mean	Standard deviation
Net migration rate (pre-pandemic)	0.003	0.19
Net migration rate (pandemic)	0.020	0.08
Difference in net migration	0.010	0.16
Log 90th percentile population density	7.770	0.96
Natural amenities	0.430	2.64
Internet access	0.720	0.14
Small urban	0.770	0.42
Medium urban	0.170	0.38
Large urban	0.040	0.21
Very large urban	0.020	0.12

Note: Calculations are based on 883 urban areas.
Sources: Federal Reserve Bank of New York Consumer Credit Panel/Equifax, U.S. Census Bureau, U.S. Department of Agriculture Economic Research Service, Federal Communications Commission, and authors' calculations.

whether the relationship between each factor and net domestic migration changed during the pandemic.

The coefficient α measures the average net domestic migration rate across urban areas, while the coefficients β_1, β_2, β_3, β_4, β_5, and β_6 measure the correlation between net domestic migration and each local factor. The coefficient γ_0 measures the average net domestic migration rate during the pandemic period. Similarly, the coefficients γ_1, γ_2, γ_3, γ_4, γ_5, and γ_6 measure the correlation between net domestic migration and each factor during the pandemic. Factors not explained by the model are captured in a residual error term ε. In the pandemic period, the relationship between net domestic migration and each local factor is the sum of β and γ for a given factor: for example, $\beta_1 + \gamma_1$. After estimating the model, we report the results in Chart 4 for each period: for example, β_1 for pre-pandemic and $\beta_1 + \gamma_1$ for pandemic. The full set of model results are reported in Table A-2. We also indicate if the coefficient values pre-pandemic versus pandemic are statistically different from each other using a t-test in Table A-3.

Table A-2

Determinants of Net Domestic Migration Rates

Local factor	Net rate
Population density	–0.05*** (0.01)
Natural amenities	0.02*** (0.00)
Internet access	0.20** (0.09)
Medium urban	0.04*** (0.02)
Large urban	0.06*** (0.02)
Very large urban	–0.001 (0.04)
Intercept	0.21*** (0.07)
Population density × pandemic	0.02** (0.01)
Natural amenities × pandemic	–0.01*** (0.003)
Internet access × pandemic	–0.06 (0.09)
Medium urban × pandemic	–0.02 (0.02)
Large urban × pandemic	–0.06*** (0.03)
Very large urban × pandemic	–0.03 (0.04)
Pandemic	–0.11 (0.08)
R^2	0.15
Observations	1,766

* Statistically different at the 10 percent level
** Statistically different at the 5 percent level
*** Statistically different at the 1 percent level

Note: Robust standard errors are in parentheses.

Table A-3

Determinants of Net Domestic Migration Rates Pre-pandemic versus Pandemic

Characteristic	Pre-pandemic	Pandemic	Pre-pandemic versus pandemic t-test
Population density	–0.050	–0.02	2.59**
Natural amenities	0.020	0.01	7.08***
Internet access	0.200	0.15	0.19
Medium urban	0.040	0.02	0.92
Large urban	0.060	0.01	2.45**
Very large urban	–0.001	–0.03	0.26

* Statistically different at the 10 percent level
** Statistically different at the 5 percent level
*** Statistically different at the 1 percent level

Endnotes

[1]We use the 2020 CBSA definitions to construct urban area measures of migration. Metropolitan statistical areas have at least one urbanized area with a population of 50,000 or greater plus "adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties." Micropolitan statistical areas have at least one urban area with a population between 10,000 and 50,000 plus "adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties" (U.S. Census Bureau 2021).

[2]We use the total number of primary individuals in the CCP in each urban area in the previous quarter as a proxy for population.

[3]We include only first-quarter data for 2021.

[4]The population, or in this case the number of primary observations in the CCP, in origin urban areas was used as the denominator to calculate net rates between each origin destination pair (for example, small urban to medium urban).

[5]Small urban areas serve as the reference category, meaning the coefficients on medium, large, and very large urban areas measure the average net domestic migration in these areas relative to small urban areas.

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