



Using Loan-level Data to Assess the PPP's Effectiveness

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The Paycheck Protection Program (PPP) offered forgivable loans to small businesses to help maintain employment and wages during the COVID-19 pandemic.^{1,2} The program involved nearly 5,500 lending institutions and disbursed 5.2 million loans totaling \$525 billion between April 3 and August 8, 2020.

Congress included the PPP in the CARES Act stimulus package because of the large concentration of small businesses within industry sectors most negatively exposed to the pandemic, and the difficulties small businesses often have in accessing outside financing. Although it appears that more than enough PPP funds were made available (with untapped funds remaining when the program closed on August 8) and numerous anecdotes tell how small firms were helped by the PPP (for instance, see [here](#) and [here](#)), the effectiveness of the program has been called into question by some analysts and academics. For instance, [it has been asserted](#) that PPP funds were allocated to geographic areas not much affected by the pandemic, and the “first-come, first-served” design [created a disadvantage](#) for the smallest of small businesses.

In this blog post, we summarize findings that contradict these assertions, based on new data and analysis described in an accompanying [research note](#). Examining the allocation of PPP loan dollars per small business employee across U.S. counties, we find that the program effectively channeled loans to counties most affected by the COVID-19 pandemic. The nation’s largest banks—categorized as those with more than \$50 billion in total assets—were particularly active in the areas hardest hit by the pandemic.

In addition, we show that counties with a higher share of smaller firms received more PPP dollars per small business employee, contrary to the popularized notion that smaller firms had less access to PPP funds. The analysis also indicates that more highly populated counties received more PPP funds per employee. This association may reflect either greater availability of, or more demand for, PPP funds in these communities.

PPP Loans Went to Localities Most Affected by the Pandemic

Our analysis uses the loan-level data made available by the Small Business Administration (SBA). For loans smaller than \$150,000, the data report the precise dollar amount loaned, along with the

¹ See <https://www.sba.gov/funding-programs/loans/coronavirus-relief-options/paycheck-protection-program#section-header-0> for details, including eligibility criteria and a list of participating lenders.

² The program incentivized businesses to retain workers by forgiving loans if the business maintains its average employee count and compensation, and if the money is used for payroll, rent, mortgage interest, or utilities.

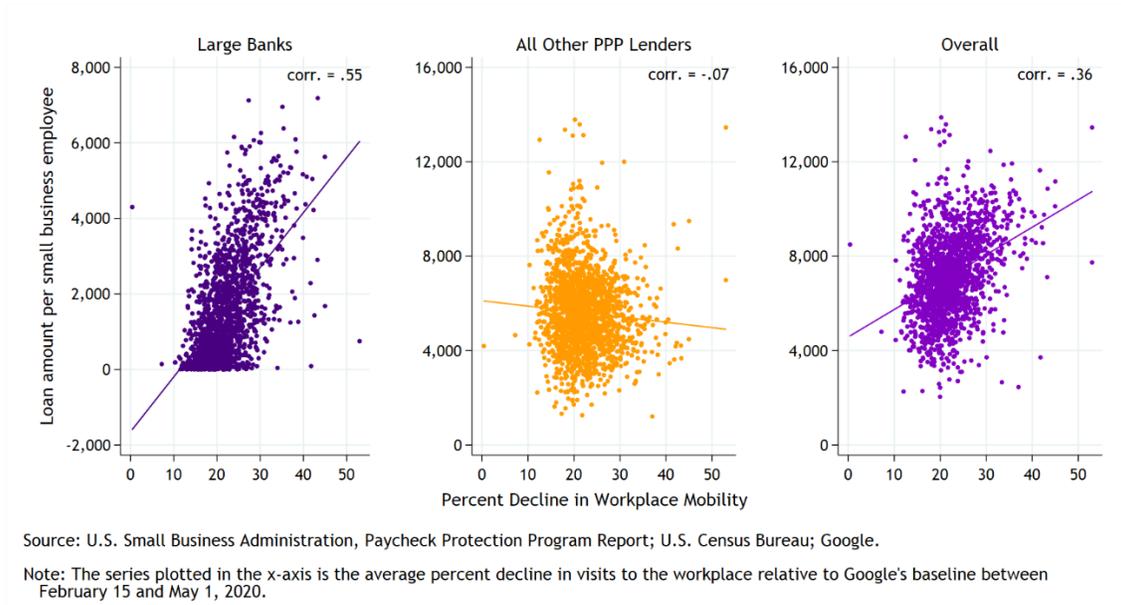
geographic location (state, county, and ZIP Code) of the recipient business. For larger loans, the name and address of each business is also included, but loan size is identified only within ranges.³

Given that the PPP’s primary objective is employee retention, our measure of program performance by county is dollars disbursed per small business employee in the locality. We restrict attention to counties in metropolitan or micropolitan areas.⁴ Total employee counts and payroll amounts by company size range in each county and are from the U.S. Census Bureau’s Statistics of U.S. Businesses.

We use a county-specific worker mobility index generated by [Google](#) to examine the correlation between PPP lending patterns and the disruption in economic activity caused by COVID-19 and associated containment actions imposed by the government (e.g., social distancing). The index measures the percentage decrease in visits to the workplace relative to a pre-pandemic baseline.⁵ We believe this measure is a meaningful proxy for economic disruption and is preferable to alternatives such as COVID-19 cases per capita, since many states imposed strict lockdowns that forced small businesses to shut down despite low average cases.

Figure 1 displays scatterplots of counties positioned by PPP loan amounts per small business employee (y-axis) and percentage decline in workplace mobility (x-axis). The left panel shows loans originated by large banking organizations (those exceeding \$50 billion in total assets); the middle panel shows loans originated by all other lenders; and the right panel shows all PPP loans.

Figure 1: PPP Loan Volume per Employee versus Economic Disruption in Counties



³ To calculate total loan volumes by county, we set the amount of each loan \$150,000 or greater equal to the average loan amount in the corresponding range, based on the SBA’s July 10 published aggregate report.

⁴ Micropolitan areas are included in the definition of rural communities by U.S. government agencies.

⁵ We calculate the daily average percentage decline in the index. Our cutoff date for this calculation is May 1, after which mobility trends begin to shift, though most PPP funds had been dispersed.

The left panel shows strong positive correlation (55.1 percent) between PPP dollars per small business employee and decline in workplace mobility. This demonstrates that large banks dispersed more PPP loans to localities that experienced the highest economic disruption as a result of the pandemic. In contrast, the middle panel shows essentially no relationship—a slight negative correlation (–7.3 percent)—between the decrease in visits to the workplace and the PPP loans per employee made by other lenders. The full sample shows a positive correlation (35.6 percent), reflecting the lending behavior of large firms. The program overall thus appears to have allocated a larger share of funds to cover employees in counties more disrupted by the pandemic. Large banks were particularly active in this regard.

Findings from Multivariate Analysis

The variation in PPP lending activity across localities reflects not only COVID-19 economic impacts but other key determinants for the demand of PPP loans, such as the size distribution of small businesses around the country. To disentangle the various factors, we estimate regression equations of PPP loan volume per small business employee in each county in relation to various potential explanatory variables from our data. This analysis is conducted both for the aggregate of all lenders as well as specifically for large banks.

Table 1 shows the estimated increases in PPP dollars per employee across counties with differing characteristics, as implied by the regression models. These incremental amounts are shown both in total dollars and in relation to (as a percentage of) dollars-per-employee in the average county.⁶

Table 1: Estimated Relationships to PPP Dollars-per-Employee

	All PPP Lenders		Large Banks	
	Increase in PPP \$ per Employee	As % of \$7,166 Sample Average	Increase in PPP \$ per Employee	As % of \$1,580 Sample Average
Decline in Mobility: 40 versus 10 Percent	\$ 756	10.5%	\$ 1,863	117.9%
Population: 1 Million versus 100,000	\$ 493	6.9%	\$ 1,121	70.9%
Small-firm Share: 50 versus 25 Percent	\$ 392	5.5%	\$ 399	25.2%

First, the multivariate analysis confirms the positive association between degree of economic disruption (decline in visits to the workplace) and PPP dollars per employee. Moreover, this association is demonstrated to be especially strong for PPP lending by large banks.

⁶ The average PPP loan amount per employee across counties in the sample equals \$7,166 for the aggregate of all lenders and \$1,580 for large banks.

As shown in the first row of Table 1, a county with a 40-percent decline in visits to the workplace received an additional \$756 per employee compared with a county with a 10-percent decline in workplace visits. The additional PPP funds represent a 10½-percent increase relative to the sample average. As shown in the right-hand column, the results are stronger for large banks, since a county with a 40-percent decline in workplace visits received an extra \$1,863 in PPP loan per employee from large banks compared with a county with a 10-percent decline. The additional PPP funds represent a 118-percent increase relative to the sample average.

Second, the regression estimates indicate that counties with larger populations tended to receive more PPP funds per employee. For instance, a county with a population of 1 million received 7 percent more PPP dollars per employee compared with a county with a population of 100,000. This association may reflect unobserved factors related to either demand or supply across localities of different size.⁷ This relationship is stronger for large banks, consistent with earlier [studies](#) that find that small businesses in rural areas tend to rely on community banks for their financing needs.

Third, PPP loan amount per employee is positively associated with the share of local small business employees at firms with fewer than 20 employees. This association again is somewhat stronger for large banks. Specifically, we find that a county with twice the share of smaller firms receives 25 percent more PPP loans per employee from large banks compared with another county. This finding is particularly important because of concerns that smaller firms may have had more difficulty accessing the program. Contrary to those concerns, the finding suggests that smaller firms received more benefit from the PPP program than their larger counterparts after controlling for other important factors.

Conclusion

Summing up, the predominant determinant of the volume of PPP lending in a county is the number of employees at small businesses in that county. However, PPP tended to offer a larger volume of loans per small business employee in areas more affected by COVID-19. We find that large banks were particularly active in areas hardest hit by the pandemic.

In addition, the analysis indicates that more highly populated counties received more PPP funds per employee. Firms in smaller and rural communities may have had less success accessing the program, or they may have had lower financing needs. For instance, population size may control for differing characteristics of small businesses that affected the demand for PPP funds across localities.

And finally, we find that PPP loan amount per employee is positively associated with the share of local, small business employees at firms with fewer than 20 employees, contrary to the notion that smaller firms had less access to PPP funds. This relationship is also relatively strong for large banks.

Disclaimer: The views expressed do not necessarily reflect those of the Bank Policy Institute's member banks, and are not intended to be, and should not be construed as, legal advice of any kind.

⁷ It may be that PPP did not reach smaller and rural communities as effectively, consistent with previous [studies](#) that suggest that small businesses in rural areas may be underserved. Alternatively, rural small businesses may have lower funding needs, as suggested by findings from the Federal Reserve's [2016 Small Business Credit Survey](#).