Indianapolis Neighborhood Housing Partnership

Estimated Scale of COVID-19 Disruption on Evictions & Foreclosures

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EXECUTIVE SUMMARY

The global covid-19 pandemic has contributed to widespread economic disruption, impacting individuals and families across the country. In Indiana alone, unemployment claims increased more than 14 times between the week of march 7, 2020, and April 11, 2020, and there is a concern that renters and homeowners with a mortgage will face increased risk of eviction or foreclosure, respectively, as a result of the widespread employment disruption. While protections for renters and mortgagors have been included within the Governor's Executive Orders (specifically Executive Order 20-06: Temporary Prohibition on Eviction and Foreclosures) and the Federal Cares Act, these limitations are temporary and may contribute to an acute challenge once the restrictions are lifted. Within that context, this analysis seeks to estimate the potential scale of Marion County households who may be at increased risk of eviction or foreclosure as a result of the economic downturn.

This analysis examines data on the percent of household incomes spent on housing related costs, the industries in which households are employed, and how those industries have fared—locally and nationally—since the beginning of the employment disruption. Households are assessed on two measures: 1) a household's housing costs relative to its income and 2) given the industry in which they are employed, the likelihood of wage-earners within that household having experienced an employment disruption. For both of these measures, households are categorized as low-risk, moderate-risk, elevated-risk, and high-risk and considered within the conceptual framework below, Figure ES-1.

FIG ES-1. CONCEPTUAL FRAMEWORK FOR ASSESSING POTENTIAL FORECLOSURE/ EVICTION RISK

Cost-Burden				
	High-Low	High-Moderate	High-Elevated	High-High
	Elevated-Low	Elevated-Moderate	Elevated-Elevated	Elevated-High
	Moderate-Low	Moderate-Moderate	Moderate-Elevated	Moderate-High
	Low-Low	Low-Moderate	Low-Elevated	Low-High
	Employment Disruption			

Those that are categorized as a high risk on one measure and moderate, elevated or high risk on the other measure, as well as those categorized as an elevated risk on both measures, were considered to be at heightened risk of foreclosure or eviction. The analysis suggests 19,443 homeowners with a mortgage in Marion County, 16.5 percent of those considered within the analysis, may be at a heightened risk of foreclosure; likewise, 29,678 renting households, 22.0 percent of those considered within the analysis, may be at a heightened risk of being unable to meet rent obligations.

Absent an economic disruption, given recent 90-day mortgage delinquency rates and eviction rates for Marion County, it might be expected that nearly 1,300 homeowners would be at substantial risk of foreclosure and an annual 9,864 evictions could have been expected to occur. As such, the current economic disruption represents a substantial increase in both homeowners and renters who may have difficulty meeting the obligations of their mortgages or leases relative to historic norms.

Governor Holcomb's Executive Order 20-06 temporarily protects renters and mortgages through halting evictions and foreclosure proceedings; at present, this Order is in effect through June 4. Similarly, the federal CARES Act temporarily prevents evictions from rental units receiving federal assistance through July 25; it also enables many homeowners to seek a loan forbearance for a minimum of 180 days (with the ability to extend a forbearance for another 180 days).

Given the temporal differences in protections available to renters and homeowners, it is anticipated that the impact of the economic disruption will be realized by renters in the very near term, perhaps as early as June. Homeowners with a mortgage may be able to delay negative housing outcomes, for six months if not longer. Nevertheless, a prolonged economic downturn may deeply impact many Marion County households, renters and homeowners alike, especially those households which fall behind in their rent or mortgage obligations and find it difficult to secure employment due to the economy.

INTRODUCTION

Beyond the health and mortality impacts of COVID-19, the pandemic has caused substantial economic disruption to people's livelihoods locally and across the nation. With state and locally-directed stay-at-home orders, many are facing decreasing work hours and/or outright unemployment. According to data from the Indiana Department of Workforce Development (via STATS Indiana), total unemployment claims for the State of Indiana grew from 20,927 for the week of March 7, 2020, to 295,766 for the week of April 11, 2020, a magnitude of increase of more than 14 times.[1] For Marion County, over the same period, unemployment claims increased from 3,233 to 38,298, an increase of 11.8 times.

As the economic fallout of the pandemic is realized by households across Marion County, it is anticipated that many households will have difficulties meeting several financial obligations, including their rent or mortgage obligations. Through state executive order and through the federal CARES act, there are temporary protections for renters and mortgage holders; however, these protections may simply delay the fiscal challenge until the time at which these protections expire.

According to the US Consumer Financial Protection Bureau, the CARES Act provides borrowers with federally-backed mortgages the right to request a forbearance for up to 180 days, with the right to an extension. While this may provide temporary relief for mortgage-holders, some loan servicers may require a lump sum payment at the end of the deferral period and/or increase subsequent monthly payment. The end of the forbearance may defer, but not eliminate, the financial hardship of the mortgage-holder, especially if the economy enters a prolonged recession or period of limited economic growth.[i]

According to the Congressional Research Service, the CARES Act provides similar protection to some renters; however, federal protection is limited to rental properties receiving federal assistance or federally-related financing, including affordable housing financed through the Low-Income Housing Tax Credit program. The CARES Act places a moratorium on eviction filings and/or late fees through July 25, 2020 (120 days from enactment). It does not absolve tenants of rent obligations, who may face eviction following the expiration of the moratorium for failing to meet lease obligations.[ii]

Per Governor Holcomb's Executive Order 20-06 regarding a Temporary Prohibition on Evictions and Foreclosures and its extension thorough Executive Order 20-25, the State of Indiana has suspended eviction and foreclosure proceedings, through June 4, 2020.[2] Similar to the federal protection, tenants are still required to pay rent and may face evictions for lack of payment or not meeting lease obligations once court proceedings resume. [iii,iv]

Given that the federal and state protections are temporary, that the economic disruption may have lingering effects and will impact some households' abilities to honor their lease or mortgage obligations, and that some of these households may see increased housing expenses in the future as a result of falling into arrears

[1] Data includes initial and continued claims. Data available (here)
[2] As of May 1, 2020.

due to COVID-19, it is anticipated that substantially more families may seek assistance with rent payments and/or foreclosure prevention services relative to historic norms.

The following presents an analysis seeking to estimate the scale of potential households that may be impacted in Marion County. The following provides some general context to current conditions, a general overview of the analytical approach to the analysis, the results of the analysis and discussion of those results, and limitations that should be considered in applying these results. A fuller explanation of the methodology and a more detailed breakdown of the results are included in the appendix. It should be noted that the following is based on limited and preliminary economic data and the results should be considered with that caveat.

CONTEXT

In assessing the financial pressures resulting from the economic disruption and how those will be experienced by homeowners and renters, it is important to recognize some differences in the timing of when those pressures are likely to be experienced. Through the CARES Act, many homeowner/borrowers are able to secure a forbearance for 180 days, with the ability to extend that forbearance for an additional 180 days. Should a homeowner/borrower avail themselves of that opportunity, the risk of foreclosure may not become acute for six months or a year from their initial inability to meet their repayment obligation. Renting households have a more limited period of protection (expiring June 4 for rental units not covered by the CARES Act and July 25 otherwise). As a result, under the legal protections currently provided, it is likely that eviction pressures will increase well before similar pressures are realized among homeowners/borrowers.

National data from the Mortgage Bankers Association's (MBA) Forbearance and Call Volume Survey (dated May 4, 2020, with data from the week ending on April 26), found that 7.54% of loans were in forbearance, a total of 3.8 million homeowners. Notably, the percentage of homeowner/borrowers in loan forbearance on March 2, in advance of the disruption, was 0.25%. Within less than two months, loan forbearances increased by a magnitude of 30 times. The most recent release from the MBA for this survey notes that while the number of mortgagors seeking forbearance continues to increase, the rate of that increase is slowing. The MBA notes they expect the share of loans in forbearance to continue to increase as new mortgage payments become due in May.[v]

There is no similar national dataset for evictions, and thus it will be difficult to assess the potential scale of the national eviction risk. Likewise, it will be difficult to place the results of a local analysis within the broader national context. With respect to risks realized by renters relative to homeowners, it may be notable that while 90-day delinquency rate for mortgagees in Marion County track relatively similarly to the nation (1.1. and 0.8 percent, respectively),[3] the eviction rate for Marion County is considerably higher than the national average (7.3% versus 2.34%, respectively).[vi,vii]

GENERAL APPROACH & LIMITED METHODOLOGY

To assess the potential risk of foreclosure and eviction, and to evaluate the potential increase to those risks attributable to economic disruption, we start by understanding the current cost of housing relative to income for mortgage holders and renters, respectively. We then categorize households across a scale of low-risk (given existing cost burden), moderate-risk, elevated-risk, or high-risk. Using industry-specific local unemployment data and federal job creation data, we use the same construct to assess potential economic disruption attributable to COVID-19 and subsequent stay-at-home order(s). A full discussion of the Methodology is outlined in Appendix A.[viii,ix]

[3] Via the US Consumer Financial Protection Bureau, the figures cited represent the most recent 12-month moving average.

Renters and homeowners experience differing realities in terms of existing cost burden. Relatively few homeowners receive mortgage financing for loan applications in which they will pay more than 30 percent of their incomes on housing related costs. For those that do, their earnings are often expected to subsequently increase over the course of the loan, which in turn reduces the percentage of income spent on housing over time. If a homeowner who typically pays 18 percent of his or her income on housing related costs is suddenly placed into a position in which they had to pay 30 percent of income, they would realize an increased risk of foreclosure.[4,5] At the same time, however, the median housing costs as a percent of income for all renters in Marion County is already 30 percent.[6]

Given the previous expenditures to service a mortgage and the tangible asset that those payments secure, a homeowner may exhaust additional avenues before accepting foreclosure. Because there are comparatively fewer avenues of recourse for renters to pursue and because previously made rent payments represent sunk costs rather than payments on an asset, renters may be comparatively less likely to seek social services to prevent eviction than a homeowner may be to prevent a foreclosure. This may be further reflected in the differing emotional attachment a homeowner feels toward his or her home than a similarly situated renter. Given those differences between homeowners and renters, and the recourse and protections available to them, in constructing this analysis we accept that it is fair to consider differing cost-burden thresholds between owners and renters.

Within our analysis, the potential economic disruption to a household is assessed through reviewing local and federal unemployment data. The most recent Marion County data, at the time of analysis, were derived from initial claims the week of April 18 and continued claims from the week of April 11. These data were available for major industry sectors (i.e., at 2-digit NAICS-level) and were not seasonally adjusted. Federal data provide greater specificity (up to 6-digit NAICS) with respect to subcategories of industry.[7] It is worth noting that this approach only shows employment impacts as a binary option: either having or having not filed for unemployment at the local level or the presence of a job/no job at the federal level. The data do not account for workers who may remain employed but have experienced a limiting of their hours, a reduction in pay, or other impacts.[8]

[4] A note on data used within this report: unless otherwise noted, local data referenced throughout this report are derived from the 2018 1-year American Community Survey Public Use Microdata Sample (PUMS). These data are organized and aggregated for the purposes of this analysis, as such, the data reported may vary slightly from data reported through the US Census summary data files or other organizations linking to that source data at the summary level.

[5] Within Marion County, the median percent of income spent on housing costs for homeowners with a mortgage is 18 percent.

[6] Housing costs, as reflected in the American Community Survey, include mortgage payments, rent payments, condominium fees, real estate taxes, premiums for homeowners in surface, and utility costs. Because gross rents include additional costs such as common area amenities, cleaning, maintenance, and a return on investment to owners that either do not exist for homeowners or are not considered within the definition of housing costs for homeowners, rents for similar units are generally higher, relative to income, than homeowner costs (even after controlling for incomes).

[7] NAICS stands for the North American Industrial Classification System. It is the standard used by federal statistical agencies in classifying business and industry data.

[8] At the local level, the most disrupted industries were as follows: Accommodation and Food Services, Other Services, Arts Entertainment and Recreation, and Retail. At the federal level, the following industries showed the most disruption (note the level of specificity within the federal categories relative to local): Scenic and Sightseeing Transportation; Amusements, Gambling and Recreation; Clothing and Clothing Accessories stores; Arts, Entertainment, and Recreation; and Personal and Laundry Services.

Using a statistical measure of distribution from the mean (z-score) for each industry sector/subsector for both employment datasets, we assess the impact of the economic disruption for a given industry relative to all industries for which data were available. For each record, the z-scores were joined based on the industry listed for the individual record in the dataset. The two measures (the local and federal) were then weighted with 2/3 of the weight given to the local measure due to its reflection of local conditions. This figure was then translated to a categorical scale of low, moderate, elevated, or high, reflecting the potential likelihood that an individual/household would realize an income disruption related to COVID-19 and the subsequent shutdown.

Homeowners with a mortgage or renting households were separated to assess the impacts separately,[9] and the total number of households fitting each unique criterion were summed and categorized based on risk thresholds (see Figure 1 for conceptual framework, see Appendix A for more information about categorical thresholds).

FIG 1. CONCEPTUAL FRAMEWORK FOR ASSESSING POTENTIAL FORECLOSURE/EVICTION RISK

Cost-Burden				
	High-Low	High-Moderate	High-Elevated	High-High
	Elevated-Low	Elevated-Moderate	Elevated-Elevated	Elevated-High
	Moderate-Low	Moderate-Moderate	Moderate-Elevated	Moderate-High
	Low-Low	Low-Moderate	Low-Elevated	Low-High
	Employment Disruption			

Following the preliminary categorization of households in accordance with the above, households with multiple earners were then considered. For housing records indicating a second wage-earner, the industry impact of the householder was averaged with the second wage-earner and the employment disruption measure for those records were recategorized based on the averaged figure. This adjustment was only applied to the second person within the household; the potential employment disruption for a third or subsequent wage-earner within a given household was not considered. Nevertheless, because the housing cost-burden was based on total household income, those individuals' incomes would still be considered within the cost-burden categorization.

Lastly, if the head of household was not employed in the 2018 PUMS dataset and no subsequent wage earners were listed, these records were omitted from the final results. While we recognize that these homeowners or renters may be at risk of foreclosure or eviction, respectively; they would not necessarily be at an increased risk resulting from employment disruption attributable to the economic downturn. Omitting these records impacts 45,877 housing units (or 15.3 percent of records); these records likely represent a limited number of households that have an out-of-work householder actively seeking employment as well as retirees and/or others not actively seeking employment.

Among occupied housing units, the following housing units were not considered within the final analysis: housing units owned without a mortgage (i.e., owned free and clear and not at risk of foreclosure, n=62,999), those that are occupied without paying rent (n=4,314), those in which the head of household is not employed and therefore not at increased risk of foreclosure/eviction due to employment disruption (n=45,877), those for which there were not complete housing and employment records (n=4,528), and those for whom housing costs were not available (n=2,693). In compiling the dataset for analysis, as outlined above, a total of 253,222 housing units, out of the 373,633 occupied housing units listed in the 2018 PUMS dataset, were considered within the analysis.

[9] Housing units that were owned without a mortgage, units that were occupied without paying rent, and group quarters were excluded from the analysis.

RESULTS & DISCUSSION

The results were categorized by the tenure status of the household (i.e., homeowner with a mortgage or a renter) and then further categorized according to cost burden and employment disruption.

The results for homeowners and renters are presented separately. Figure 2 shows the number of homeowners with a mortgage by category of risk; Figure 3 shows the proportion of each risk categorization relative to all homeowners with a mortgage. Figure 4 shows the number of renters by category of risk; Figure 5 shows the proportion of each risk categorization relative to all renters. Appendix B provides a more detailed breakdown of the findings, with each risk measure broken into deciles.

The analysis finds that 11,165 homeowner/borrowers are at an elevated or high risk on both measures. An additional 8,278 homeowners with a mortgage have either a cost burden or potential employment disruption and moderate on the other measure.

In total, 19,443 homeowners, representing 16.5 percent of all homeowners with a mortgage, are identified as being at a minimum of an elevated risk on both measures or a combination of high risk on one measure with at least a moderate risk on the other. Within Figures 2 and 3, these owners, those represented by the upper-right cells, are those that are most likely to need to consider forbearance, foreclosure prevention services, or otherwise need to engage in some measure of strategizing around loss mitigation.

Similarly, the analysis finds 20,412 renters at an elevated or high risk on both measures. An additional 9,266 renters are categorized with a combination of high risk on one measure with a moderate risk on the other. Taken together, this represents 29,678 renting households, or 22.0 percent of all renters, at a heightened risk of eviction given current economic circumstances.

FIG 2. HOMEOWNERS WITH MORTGAGE BY RISK CATEGORY

Cost-Burden	Employment Disruption: Low	Moderate	Elevated	High
High	9,703	4,300	1,976	6,424
Elevated	4,121	1,822	918	1,847
Moderate	7,362	3,210	785	3,978
Low	38,134	15,984	3,468	14,066

FIG 3. HOMEOWNERS WITH MORTGAGE BY RISK CATEGORY AS A PCT. OF ALL HOMEOWNERS WITH MORTGAGE

Cost-Burden	Employment Disruption: Low	Moderate	Elevated	High
High	8.2%	3.6%	1.7%	5.4%
Elevated	3.5%	1.5%	0.8%	1.6%
Moderate	6.2%	2.7%	0.7%	3.4%
Low	32.3%	13.5%	2.9%	11.9%

FIG 4. RENTERS BY RISK CATEGORY

Cost-Burden	Employment Disruption: Low	Moderate	Elevated	High
High	10,397	3,082	2,591	12,884
Elevated	4,514	3,136	1,470	3,467
Moderate	9,591	3,593	903	6,184
Low	35,200	13,686	6,475	17,951

FIG 5. RENTERS BY RISK CATEGORY AS A PCT. OF ALL RENTERS

Cost-Burden	Employment Disruption: Low	Moderate	Elevated	High
High	7.7%	2.3%	1.9%	9.5%
Elevated	3.3%	2.3%	1.1%	2.6%
Moderate	7.1%	2.7%	0.7%	4.6%
Low	26.1%	10.1%	4.8%	13.3%

Given 90-day delinquency rates in Marion County of 1.1 percent [vi] and an annual eviction rate of 7.3 percent, [vii] it may be expected that 1,299 serious delinquencies and an annual total of 9,864 evictions would have occurred even absent the COVID disruption.[10] As seen in Figures 2 and 4, the total number of households showing the highest levels of risk on both measures analyzed exceed the total number of delinquencies or evictions, respectively, that could have been expected absent an employment disruption. While these households would likely have experienced housing difficulties even absent an employment disruption, they would still likely seek assistance through any available programs and should be considered within the potential scale of any available program.

It is reasonable to expect that the impact to renting households will be more widespread and felt more immediately than those realized by homeowners in the short term. Further, because there are limited statutory protections and little variation in the recourse available to renters, it is possible that these impacts may occur within a short period of time: a first wave occurring shortly after Indiana reopens court activities and perhaps a second following the 120-day statutory limitation within the CARES Act.

The impact to homeowners is likely to be delayed relative to renting households given the protections granted within the CARES Act. However, depending upon the terms of forbearance agreements and the degree to which a substantial impact is simply delayed rather than mitigated, the impact may represent a future liability to many mortgagors. A prolonged economic disruption, in which economic conditions continue to deteriorate or recovery is slow, may create situations for some homeowners where they are unable to meet the terms of their forbearance agreements when their payments recommence.

LIMITATIONS

There are several limitations that a reader should be aware of in examining the results of this analysis. These limitations have to do with the availability of data, nuances with the available data, the preliminary nature of some of the data, methodological choices, and the current dynamic environment that may unfold unpredictably, given what has been experienced thus far with the disruption.

First, the economic disruption data is focused solely upon unemployment claims for Marion County data and the number of jobs for federal data. While this represents a useful indicator for those who have likely lost all income and the difficulty of finding new work in a given sector, it does not add clarity among those professions where a person has not become unemployed but lost substantial pay due to a reduction in hours worked, reduced commissions, or other similar pay related concerns. These data may not uniformly capture the impacts of furloughs which may be more common in certain industries. Additionally, it assumes individuals remain employed within the same industries; therefore, it likely underestimates an individual's ability to find work in a growing industry to replace a job lost in a troubled industry.

Secondly, the economic data at the local level are limited to major industry sectors which may mask substantial differences among subsectors within the same industry sector. For example, Health Care and Social Assistance are considered a singular industry sector. This sector contains those who work at hospitals, which may be seeing increased work, and those that work at outpatient facilities, which may be temporarily closed. Similarly, within the retail sector, some larger warehouse style stores (e.g., Wal-Mart, Meijer) may see increased

[10] Given the 118,098 homes owned with a mortgage and 135,124 households occupied with rent included within this analysis and applying the most recent available data on delinquency and eviction (the most recent 12-month moving average for delinquencies and 2016 data for evictions).

employment, while boutique retailers see closures. These within-sector nuances are more sufficiently captured within the federal data; however, the federal data are preliminary reports and are subject to revision over the coming months as is typical with federal employment data.

Additionally, the economic experience by industry that has been felt heretofore may not necessarily be a harbinger of future impacts. While some already-impacted industries may likely experience prolonged challenges, others may have fared relatively well thus far but will see increasing challenges in the future. For example, those working in public administration are unlikely to realize an impact in the short term, but as tax revenue that support their positions erodes, they may see future impacts. Those that fall into groups that will experience challenges in the future would not be identified within this analysis. At a minimum, it is anticipated that a prolonged economic disruption will only further impact additional industries and further strain households already realizing a housing cost burden.

For housing and individual records derived from the PUMS data, the data were limited to the householder, and if listed, a second wage-earner. There are a handful of records within the dataset that list more than two wage-earners in a household. While the aggregate household incomes of all earners were considered as part of the housing cost-burden, only the first two wage earners were considered within the potential employment disruption. Further, no attempt was made to discern the differences in wages between a head of household and a secondary wage earner, rather they were weighted similarly. In households where there is a great divergence in earning potential between wage earners and those wage earners, the analysis likely underestimates the potential risk of losing the income from the higher earning job.

Our analysis frames the potential risk of disruption on existing cost burden and the likelihood of economic disruption in a given industry. The analysis assumes anyone employed within an industry that is in the top half of industries impacted may be, at a minimum, moderately impacted (with higher thresholds at the 67th and 75th percentiles). While this framing is relevant in an economic environment in which some industries are more greatly impacted than others, because this approach compares an industry against the economy as a whole, it would be inadequate in measuring employment disruptions that were spread evenly across all industry sectors. Should the economic disruption grow to broadly impact all industries (i.e., a widespread recession experienced equally across industries), this methodology may under-report the risk of economic disruption in some sectors.

Similarly, the risk posed by cost-burden uses thresholds to establish categories of risk. These are established at differing thresholds for renters and homeowners for the reasons discussed throughout the paper. There is little definitive guidance as to where these thresholds should be established. The renter thresholds largely mirror conventions around housing cost-burden (30 and 50 percent of income). However, that same threshold among homeowners would yield a result that shows very few homeowners at risk of foreclosure, a finding that belies the reality of a 30-fold increase in forbearance requests. Thus, establishing these thresholds, particularly for homeowners with a mortgage, requires some measure of judgment and informed intuition; a reader may examine the results without the categorical thresholds (organized by decile) via the tables in Appendix B.

This analysis relies on survey data collected by the US Census which has a 90 percent confidence level and there may be some variation between reality and the measures reported here. These variations, as a matter of degree, can be greater among metrics that are cross-tabulated.

Lastly, while the analysis examines the potential number of households that may be impacted; absent detailed local data, it is difficult to predict how many households will be likely to seek assistance from the public sector, local nonprofits, or philanthropic entities. For homeowners, the first avenue of recourse will likely be with their

lending institution, and they may only turn to secondary sources following an initial engagement or a continued deterioration of their financial situation. At the same time, lenders may refer individuals to local entities providing foreclosure prevention services, which could increase the work of local nonprofits providing those services.

For renters, the need is likely to be substantial, but it is difficult to assess the volume of renters that will seek assistance and/or assume to whom they will turn, absent additional data about the volume of requests that are fielded across the social services sector in more stable times.

As additional data become available—especially data at the local level that provide insights into how households are faring within the economic downturn, the volume of those seeking assistance, and the organizations with whom they are engaging—this analysis may be refined to provide greater precision. Given the data presently available, and assuming economic conditions that have been realized thus far extend into the future beyond the protections extended through the Governor's Executive Order and the CARES Act, the impacts of the economic disruption will be deeply felt by many Marion County households, and many of these households will experience increased housing challenges as a result of the disruption.

END NOTES

[i] US Consumer Financial Protection Bureau: CARES Act Mortgage Forbearance
[ii] Congressional Research Service: CARES Act Eviction Moratorium
[iii] Office of Indiana Governor Holcomb: State of Indiana Executive Order 20-06
[iv] iv Office of Indiana Governor Holcomb: State of Indiana Executive Order 20-25
[v] Mortgage Bankers Association: Share of Mortgage Loans in Forbearance Increases to 7.54%:
[vi] US Consumer Financial Protection Bureau: Mortgages 90 or More Days Delinquent
[vii] Eviction Lab: Marion County
[viii] IN-DWD (via STATS Indiana):Weekly Unemployment Claims
[ix] US Bureau of Labor Statistics: Current Employment Statistics: Employment and Earnings Table

APPENDIX A: FULL METHODOLOGY

The data for this analysis were derived from three sources:

- Housing, industry of employment records, as well as several other characteristics were drawn from the 2018 1-year American Community Survey Public Use Microdata Sample. The housing and person records data were pulled; these data were subset to Marion County, and then subset again to limit the records to heads of households and additional respondents who reported working more than 14 weeks in the past year. These data were joined based on the serial numbers in each dataset to provide a complete record of housing and personal characteristics. Housing units owned without a mortgage or lien were excluded from the analysis, as were housing units that were occupied without the payment of rent and/or group quarters.

- Weekly unemployment claims by industry were drawn from the Indiana Department of Workforce Development, via STATS Indiana. Initial claims were drawn from the weeks of 4/18 and 3/14 and continued claims were drawn from 4/11 and 3/7. The April claims were summed, the March claims were summed, and the March claims were subtracted from the April claims to identify the numerical and rate of increase in unemployment claims by industry. The rate of increase, a normalized measure, was used to conduct the analysis.

- Federal employment data from the US Bureau of Labor Statistics for the month ending April 30 were used to construct the federal employment impact. These data were available at varying levels of specificity (from 6-digit to 2-digit NAICS), and only the industries/NAICS codes for which complete data were available were used. The data provided February and April employment numbers (seasonally-adjusted) and the change in the number of jobs. The relative change (the difference between April jobs and February jobs divided by February jobs) was used to assess the employment disruption by industry.

Once the data were pulled and organized, the data were organized into a comprehensive dataset based on the joined PUMS data, with the employment data merged based on the NAICS code in the PUMS data and the employment data. For the federal employment data, the data was joined to the greatest level of specificity available. For both federal and local data, if data were not available for a given person's industry the prevailing average for the all federal or local jobs was used.

For each industry for which complete data were available, at both the federal and local levels, a z-score was constructed within each respective dataset. This statistic measures the difference in employment disruption from a given subject (in this case, an industry) from the average of all subjects. The z-scores were constructed in such a way that a positive z-score (distance from the mean in a positive direction) represented greater economic disruption.

Given the two z-scores for each record, local and federal, the scores were weighted into a single measure, with 2/3 of the weighted z-score representing local conditions and 1/3 representing federal conditions. While the assigning of relative weights is somewhat arbitrary, it balances the local nature of the Marion County data set and its relative recency with the greater precision and specificity of the federal dataset.

Given the assignment of the weighted z-score measure for each record, a statistical processing package was used to derive a weighted mean and percentile ranks (weighted based on the weights provided within the PUMS dataset), with those not employed excluded from the statistical analysis. The 50thk,

67thk, and 75thk were pulled, and those measures formed the thresholds for low/moderate risk, moderate/elevated risk, and elevated/high risk. For households reporting multiple earners the weighted z-score for the head of household and the weighted z-score for the second respondent were averaged and the risk was assigned based that average. No adjustment was made to heads of households without a second wage-earner listed.

A similar procedure was undertaken to derive the varying risk categories for homeowners and renters, although some adjustments were made to reference conventions within the established body of work relating to housing cost-burden. For each record, the Selected Monthly Owner Costs or Gross Rent Payments, as appropriate given the tenure indicated within the record, were divided by the reported household incomes; this approach provides greater precision with respect to cost-burden than the cost burden data provided within the dataset (which is rounded to the nearest percent).

The datasets were then separated by tenure and a weighted median/percentile rank analysis was performed. For renters, the 50thk, 67thk, and 75thk were 30 percent of income spent on housing, 41 percent, and 50 percent, respectively. To even the difference in the classes the moderate/elevated threshold was adjusted to 50 percent and then these figures served as the appropriate thresholds. For homeowners, the weighted median/percentile ranks returned results of 18, 23, 28 at the 50thk, 67thk, and 75thk respectively. To align with more conventional figures and to be somewhat more conservative in the analysis, these thresholds were adjusted to 20, 25, and 30 (i.e., one would be considered at a high risk above 30 percent).

Given the establishment of the class thresholds, outlined above, homeowners with a mortgage and renters were assigned to individual risk categories, and then those records were summed (as weighted within the dataset). Those households having heads of households (and, where appropriate, the second respondent) that were reported as unemployed were removed from the results (due to their being unlikely to be directly influenced by employment disruptions related to COVID-19). The resulting records were categorized appropriately and summed as outlined within the results section. The results are available, by decile, in Appendix B.

APPENDIX B: DETAILED RESULTS BY DECILE

FIG. B-1. HOMEOWNERS WITH A MORTGAGE: RISK CATEGORIZATION DETAIL

Cost Burden ← Risk	1st Decile	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	10th Decile
10th Decile	227	366	925	593	1,034	1,369	482	1,489	782	1,128
9th Decile	902	536	1,479	917	1,052	618	735	1,348	2,033	615
8th Decile	1,205	793	1,172	1,889	1,114	1,514	1,269	1,115	2,030	324
7th Decile	1,049	808	1,235	886	1,724	1,192	1,667	1,399	1,652	546
6th Decile	1,207	697	1,261	1,156	2,074	1,616	510	783	2,539	771
5th Decile	1,168	562	1,053	2,375	1,096	1,256	1,832	1,101	1,807	69
4th Decile	770	1,742	787	2,097	1,578	1,310	1,194	242	1,257	470
3rd Decile	466	732	1,012	1,629	2,185	1,190	2,127	1,243	1,728	436
2nd Decile	846	1,133	1,377	1,633	2,158	946	1,359	1,301	1,920	206
1st Decile	1,001	1,157	1,003	2,065	2,305	1,491	699	590	2,310	257
	1st Decile	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	10th Decile

Employment Disruption → Risk →

FIG. B-2. COMPOSITION OF HOMEOWNERS WITH A MORTGAGE: RISK CATEGORIZATION DETAIL

Cost Burden ← Risk	1st Decile	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	10th Decile
10th Decile	0.2%	0.3%	0.8%	0.5%	0.9%	1.2%	0.4%	1.3%	0.7%	1.0%
9th Decile	0.8%	0.5%	1.3%	0.8%	0.9%	0.5%	0.6%	1.1%	1.7%	0.5%
8th Decile	1.0%	0.7%	1.0%	1.6%	0.9%	1.3%	1.1%	0.9%	1.7%	0.3%
7th Decile	0.9%	0.7%	1.0%	0.8%	1.5%	1.0%	1.4%	1.2%	1.4%	0.5%
6th Decile	1.0%	0.6%	1.1%	1.0%	1.8%	1.4%	0.4%	0.7%	2.1%	0.7%
5th Decile	1.0%	0.5%	0.9%	2.0%	0.9%	1.1%	1.6%	0.9%	1.5%	0.1%
4th Decile	0.7%	1.5%	0.7%	1.8%	1.3%	1.1%	1.0%	0.2%	1.1%	0.4%
3rd Decile	0.4%	0.6%	0.9%	1.4%	1.9%	1.0%	1.8%	1.1%	1.5%	0.4%
2nd Decile	0.7%	1.0%	1.2%	1.4%	1.8%	0.8%	1.2%	1.1%	1.6%	0.2%
1st Decile	0.8%	1.0%	0.8%	1.7%	2.0%	1.3%	0.6%	0.5%	2.0%	0.2%
	1st Decile	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	10th Decile

Employment Disruption → Risk →

FIG. B-3. RENTING HOUSEHOLDS: RISK CATEGORIZATION DETAIL

Cost Burden ← Risk	1st Decile	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	10th Decile
10th Decile	491	185	1,416	205	1,012	824	769	1,893	1,891	2,092
9th Decile	810	545	1,930	608	800	127	1,325	1,169	1,582	3,056
8th Decile	752	344	1,723	1,364	844	320	485	2,450	679	2,760
7th Decile	1,076	385	1,529	1,165	1,665	2,022	1,444	1,390	2,783	909
6th Decile	168	572	2,629	756	1,633	2,013	1,065	1,741	1,169	1,886
5th Decile	1,355	688	1,641	1,486	876	1,567	497	2,892	1,920	491
4th Decile	1,654	1,371	2,155	928	1,453	1,630	1,197	1,540	1,557	954
3rd Decile	1,347	424	1,180	983	2,504	1,209	1,534	2,202	2,174	1,427
2nd Decile	1,315	850	758	1,724	1,727	1,789	1,674	1,530	2,747	1,636
1st Decile	2,424	1,637	1,203	1,141	2,360	622	1,485	411	2,624	180
	1st Decile	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	10th Decile

Employment Disruption → Risk →

FIG. B-4. COMPOSITION OF RENTING HOUSEHODS: RISK CATEGORIZATION DETAIL

Cost Burden ← Risk											
	10th Decile	0.4%	0.1%	1.0%	0.2%	0.7%	0.6%	0.6%	1.4%	1.4%	1.5%
	9th Decile	0.6%	0.4%	1.4%	0.4%	0.6%	0.1%	1.0%	0.9%	1.2%	2.3%
	8th Decile	0.6%	0.3%	1.3%	1.0%	0.6%	0.2%	0.4%	1.8%	0.5%	2.0%
	7th Decile	0.8%	0.3%	1.1%	0.9%	1.2%	1.5%	1.1%	1.0%	2.1%	0.7%
	6th Decile	0.1%	0.4%	1.9%	0.6%	1.2%	1.5%	0.8%	1.3%	0.9%	1.4%
	5th Decile	1.0%	0.5%	1.2%	1.1%	0.6%	1.2%	0.4%	2.1%	1.4%	0.4%
	4th Decile	1.2%	1.0%	1.6%	0.7%	1.1%	1.2%	0.9%	1.1%	1.2%	0.7%
	3rd Decile	1.0%	0.3%	0.9%	0.7%	1.9%	0.9%	1.1%	1.6%	1.6%	1.1%
	2nd Decile	1.0%	0.6%	0.6%	1.3%	1.3%	1.3%	1.2%	1.1%	2.0%	1.2%
	1st Decile	1.8%	1.2%	0.9%	0.8%	1.7%	0.5%	1.1%	0.3%	1.9%	0.1%
		1st Decile	2nd Decile	3rd Decile	4th Decile	5th Decile	6th Decile	7th Decile	8th Decile	9th Decile	10th Decile
		Employment Disruption → Risk									