The Impact of Resident Services on Property Financial Performance

Submitted by:

Abt Global
6130 Executive Boulevard
Rockville, MD 20852

Submitted to:

SAHF
1120 G Street NW, Suite 800
Washington DC 20005

January 15, 2026

About This Report

Authors

Zachary T. McDermott, Debbie Bocian, and Meryl Finkel

Study Team

Zachary T. McDermott, Debbie Bocian, Meryl Finkel, Jeff Lubell (Senior Advisor), Kimberly Burnett, Keely Stater, Samaa Eldadah, Ben Carson

Acknowledgements

The study was funded through a contract with Stewards of Affordable Housing for the Future (SAHF) in partnership with the Housing Partnership Network (HPN), NeighborWorks America (NeighborWorks), Multifamily Impact Council (MIC), and the National Leased Housing Association (NLHA) and with additional financial support from the Capital One Insights Center, Morgan Stanley and National Equity Fund. The study would not have been possible without SAHF's leadership and dedication over the last several years. We are particularly grateful for the insights of Alexandra Nassau-Brownstone, Matt Sorak, Althea Arnold, Eileen Fitzgerald, and Andrea Ponsor.

Abt Global* | 6130 Executive Boulevard | Rockville, MD 20852

*In December 2023, Abt Associates changed its name to Abt Global. All references to the company in the text reflect the change to Abt Global or refer to the company as Abt except in the citations of sources that predate the name change.

Contents

Executive Summary **1**

1. Introduction **1**
1.1 Background 2
1.2 This Report 3

2. Methodology **1**
2.1 Overview 1
2.2 Quasi-Experimental Design 1
2.3 Sampling and Data Collection Overview 2
2.4 Analytic Dataset 4
2.5 Analytical Models 8
2.6 Model Categorization 9

3. Findings **11**
3.1 Presence of Resident Services 11
Primary Analysis 11
Secondary Analyses 12
Simulations 13
3.2 Impact of Resident Service Dosage 16
Exploratory Analyses: Impact of Resident Service Expenditures 16
Exploratory Analyses: Impact of Resident Service Staffing 19
3.3 Summary of Alignment of Findings with Hypotheses 22
3.4 Limitations 23

4. Discussion **25**

Appendix A. Study Partners and Participating Organizations **27**

Appendix B. Logic Model **29**

Appendix C. Sampling and Data Collection **31**
C.1. Sampling Approach 31
C.2. Data Collection 32
Data Elements Collected 33

Appendix D. Descriptive Statistics, Key Variables **35**

Appendix E. Number of Properties and Property-Year Observations by Model **37**

Appendix F. Results From Primary Model **38**

Executive Summary

This study, spearheaded by Stewards of Affordable Housing for the Future (SAHF) and with support from and in collaboration with Housing Partnership Network (HPN), NeighborWorks America (NeighborWorks), Multifamily Impact Council (MIC), and National Leased Housing Association (NLHA),[1] examines the relationship between resident services in affordable rental properties and the properties' financial performance. The study uses a quasi-experimental design to test the hypothesis that the coordination and provision of resident services improves properties' financial health.[2]

Data and Methodology

To test this hypothesis, we gathered data from 248 rental properties (156 service-enriched properties and 92 non-enriched properties) representing 19 different affordable housing organizations. The data, which spanned the years 2015-2019, included a wide range of property-level financial indicators across seven domains.[3] Using this data, we employ regression analysis to assess the relationship between the provision of resident services in a given year and property financial outcomes in the following year.[4] Regression analysis allows us to estimate differences in financial outcomes between service-enriched and non-enriched properties controlling for other factors that may differ between the two groups such as property size, age, and use of and type of subsidies. By controlling for these other factors, we can more confidently attribute observed differences in financial outcomes to the coordination and provision of resident services.

Key Terms

Resident services are "programs, services, and referrals that are provided in a housing context and that are designed to support greater stability and wellbeing for residents."[1] Resident services are typically provided by dedicated staff, often called "Resident Services Coordinators", and through robust partnerships. Common resident services include financial counseling, health programs, youth activities, and initiatives focused on housing stability and community engagement.

Resident service coordination refers to "all functions tied to an organizational mission to implement resident services in affordable housing rental properties, including corporate and site-based staff, funding, technology systems, services and programs, research and evaluation, organizational knowledge, and the tools necessary to support resident services."[1]

Service-enriched properties refer to rental properties that coordinate and offer resident services while *non-enriched properties* do not offer these services.

Throughout the report, we use the term "resident services" to refer to both the coordination function and actual provision of services.

[1] For a full description of these organizations (collectively our "Study Partners"), see Appendix A.

[2] This hypothesis emerged under prior research that included the development a logic model linking resident services to the financial performance of properties. The logic model theorizes that the coordination and provision of resident services help residents overcome personal and economic challenges, which can lead to greater financial and personal stability. In addition, resident services can lead to greater resident satisfaction and community cohesion. These improvements, in turn, can translate into improved property-level outcomes, such as lower rates of late and missing rent payments, lower resident turnover, and reduced maintenance costs, all of which should ultimately lead to improved property financial health.

[3] We relied on 2015-2019 "pre-COVID" data due to concerns about disruptions and distortions in properties' finances during and in the immediate aftermath of the pandemic.

[4] We model the financial outcomes the year after the year of the provision of resident services to help ensure that the causal direction flows from the provision of services to the financial outcomes and not the other way around. That is, by using the provision of services the year prior to the financial outcomes, we reduce the likelihood that our estimates reflect "reverse causation", that is, that the decision to offer resident services is based on the financial performance of the property. Having said that, to the degree that the decision to offer resident services may be based, at least in part, on projections of future financial performance, our estimates may still reflect such "reverse causation."

We group our regressions into three categories of analyses: primary, secondary, and exploratory.[5] For our ***primary analysis***, we compared the net operating income (NOI)—a key indicator of affordable housing property financial health—in a given year of those properties that coordinated and provided resident services in the prior year with those that did not, controlling for other factors. For our ***secondary analyses***, we compared 16 other measures of financial performance between properties that coordinated and provided resident services in the prior year with those that did not, controlling for other factors. For our ***exploratory analyses***, we compared all 17 financial outcomes in a given year between properties that provided different "dosages" of resident services in the prior year (as measured by the amount of money spent on resident services and the number of full-time equivalent (FTE) employees dedicated to resident services), controlling for other factors.[6] In all, we conducted 51 regressions, which are summarized in Exhibit ES-1.

Exhibit ES-1. Analysis Summary

	Primary Analysis	Secondary Analyses	Exploratory Analyses	
Independent Variable (lagged)	Binary variable to represent whether the property does or does not coordinate and provide resident services	Binary variable to represent whether the property does or does not coordinate and provide resident services	Dollars/unit spent on resident services	Number of FTE staff dedicated to resident services
Number of OLS Regressions	1	16	17	17
Dependent Variable	Net Operating Income (NOI)	16 different financial outcome variables (one per regression)	NOI and each of 16 different financial outcome variables (one per regression)	NOI and each of 16 different financial outcome variables (one per regression)
Subsidy Controls (lagged)	Given the strong role that subsidies can play in the financial modeling of affordable housing properties, all regressions across all analyses control for the following: Low-Income Housing Tax Credit (LIHTC), Project-based Section 8, Project-based vouchers, Project Rental Assistance Contracts (PRAC), and state/local subsidies.			
Additional Control Variables (lagged)	All regressions in all analyses also control for: the sponsoring affordable housing organization of the property, the building age and number of units, the target population (e.g., seniors), whether the property includes permanent supportive housing units, and the poverty rate and median rent of the census tract in which the property is located.			

[5] The grouping of analyses into primary, secondary and exploratory—which we specified in advance of developing findings—helps limit the influence of "false positives", which are more likely to occur when large numbers of regression analyses are performed and allows us to put greater emphasize on analyses that rely on stronger, more reliable data. It also helps with interpretation by elevating those analyses that: 1) were most important to our hypothesis versus those that were supportive but less definitive; and 2) were based on stronger, more reliable data.

[6] Importantly, participating organizations expressed concern that the data available from the participating properties would not accurately and comprehensively capture the expenditures on and staffing dedicated to resident services. We therefore are less confident in analyses using these "dosage" measures than in our other analyses.

Key Findings:

Overall, our findings support the hypothesis that coordinating and providing resident services results in improved property financial health in the years preceding the COVID-19 pandemic.

- ***Primary analysis*:** Our primary analysis estimates that, on average, service-enriched properties have higher NOI than similarly situated non-enriched properties. Specifically, we find that the provision of services is associated with a 26% increase in NOI relative to the average NOI of properties within the same organization, all else equal. For the average property, this translates to almost $1,200 in additional NOI per unit in the following year. This finding is supportive of a positive impact of resident services on overall property financial health.
- ***Secondary Analyses***: Our secondary analyses produce several findings that are also supportive of resident services leading to more favorable financial outcomes. In particular, service-enriched properties are associated with higher revenue and marginally lower arrears and levels of bad debt the year following resident services compared to non-enriched properties. However, contrary to our hypothesis, we find that service-enriched properties are associated with higher maintenance and security expenses.
- ***Exploratory analysis***: Our exploratory analyses provide mixed support for our hypothesis.
  - *Expenditures on Resident Services*: Our exploratory analyses find favorable relationships between expenditures on resident services and all financial outcomes related to operating income and revenue, consistent with hypothesized impacts. For example, we estimate that every $100 per unit spent on resident services corresponds to an increase of $259 and $397 in NOI and total revenue, respectively, in the following year. However, similar to our secondary analyses, we find that increases in resident service expenditures are associated with increases in expenses.
  - *Full-time equivalent employees*: Of the 17 estimated relationships between FTEs dedicated to resident services and property-level financial outcomes, the vast majority (15) were not statistically significant. The exceptions were: 1) a negative and statistically significant relationship between FTE dedicated to resident services and arrears, which is consistent with our hypothesis; and 2) a positive and significant relationship between FTE dedicated to resident services and non-resident service expenditures, which is contrary to our hypothesis.

Conclusions:

Our estimate of the relationship between the provision of resident services and NOI in the primary analysis provides compelling evidence that coordinating and providing resident services results in significant enhancements to net operating revenue. On average, we estimate that providing resident services in a given year improves NOI by almost $1,200 the following year. This amount represents a large and significant improvement.

While estimates from our secondary and exploratory analyses provide less consistent patterns regarding the impact of resident services on intermediate financial outcomes, we do see evidence of favorable impacts of resident services on NOI and revenue-related outcomes, consistent with our hypotheses. Having said that, we do not observe the expected impacts for several intermediate outcomes that we anticipated would be the mechanisms through which resident services would impact NOI and revenue. In fact, while in many cases we observe no statistical impact on these outcomes, we find that resident services is associated with an increase in many expense-related outcomes, which is actually contrary to our hypothesis. One potential explanation for this finding is that properties that are in better financial

positions as a result of providing resident services are also better positioned to spend on other property needs, though more research is needed to fully understand the observed patterns.

Collectively, these findings suggest that the coordination and provision of resident services has a positive impact on NOI but that our models may not fully capture the complex mechanisms through which these services impact property financial health. Future research should explore alternative pathways through both quantitative and qualitative methods. In addition, future research should rely on more recent, post-COVID data to better reflect current resident services policies and practices.

Study Limitations:

As is true with all quasi-experimental analyses, this study has important limitations. First, "resident services" and the coordination of these services can refer to a wide range of programs. The study does not attempt to assess the quality of services or estimate impacts separately for different types of services. Second, variability in the quality and completeness of our data—particularly with respect to amount spent on and the number of staff dedicated to resident services—may have led to inaccurate estimates of the relationship between the "dosage" of resident services and financial outcomes. Third, while we attempted to control for as many observable property and neighborhood characteristics as possible, there may be other important factors that are omitted from our models. To the degree that such factors are correlated with both resident services and the financial outcomes in our analyses, our estimates will be biased. Relatedly, while our approach provides strong evidence for a favorable relationship between resident services and financial outcomes, it does not prove a *causal* relationship. Fourth, our analyses relied on 2015-2019 data and, therefore, our findings are specific to this pre-Covid timeframe. Caution should be exercised when extrapolating beyond this timeframe. However, due to how resident services have evolved since the COVID-19 pandemic, with many organizations leveraging resident services staff to focus more on housing stability and reducing rent arrears in a more targeted way. Combined with a greater emphasis on evidence-based approaches and data-informed decisions in more recent years, there are reasons to believe that the impact of resident services on property financial performance may be stronger in the current environment than observed during the study period.

1. Introduction

Affordable housing owners and operators often coordinate and provide services to residents to support their self-sufficiency and improve their quality of life. These resident services can take a wide range of forms and can cover areas such as eviction prevention, financial education, health, employment, and community building. Research shows that the coordination and provision of these services can have positive impacts on resident outcomes such as housing stability, community engagement, financial resilience, health and wellness, and education.[7] However, in many instances, funding for resident service coordination and provision is not prioritized (e.g., by policymakers, lenders, investors, funders, and/or owners) and is not included as an operating expense. As a result, property owners and operators often must secure funding for these services separately from the basic funding used to support day-to-day operations. This constraint can make it difficult to implement consistent, quality resident services for all residents who would benefit from them.

What are Resident Services?

Resident services is a term used to describe "programs, services, and referrals that are provided in a housing context and that are designed to support greater stability and wellbeing for residents."[8] Resident services are typically provided by dedicated services staff, often called *resident services coordinators*, and through robust external partnerships. Common resident services include financial counseling, health programs, youth activities, and initiatives focused on housing stability and community engagement.

Resident service coordination refers to "all functions tied to an organizational mission to implement resident services in affordable housing rental properties, including corporate and site-based staff, funding, technology systems, services and programs, research and evaluation, organizational knowledge, and the tools necessary to support resident services."[9]

Service-enriched properties refer to rental properties that offer resident services. The specific types of programs and services provided at a given property vary and are tailored to meet the priorities of each residential community. Examples of services include eviction prevention initiatives, food access support, health and wellness programming and navigation, financial stability and asset building programs (e.g., Family Self Sufficiency (FSS) Program), after school and other programs for youth, and initiatives to address isolation and loneliness.

Throughout the report, we use the term "resident services" to refer to both the coordination function and actual services being provided.

Understanding whether and to what degree providing resident services may improve the financial performance of affordable housing properties could help support the case for incorporating the costs of these services in operating costs. However, while there is some research suggesting a positive relationship between resident services and property cost savings, there has not been, to date, a large-scale study examining this relationship.[10] This report, spearheaded by the Stewards of Affordable Housing for the

[7] See Nicole Manchester and Andrea Ponsor, *The Impact of Home: Building to Opportunity, Health & Equity* (Stewards of Affordable Housing for the Future, 2021).

[8] See glossary provided by Certified Organization for Resident Engagement and Services available at Glossary | CORES.

[9] Ibid.

[10] Existing evidence is based on two brief studies conducted within two affordable housing organizations over a decade ago. See Terry Galpin-Plattner, *Research Shows the Cost Benefits of Resident Services on the Performance of Property Operations* (Community Housing Partners and NeighborWorks America, 2009) and Terry Galpin-Plattner, *Research Demonstrates*

Future (SAHF) and with support from and in collaboration with the Housing Partnership Network (HPN), NeighborWorks America (NeighborWorks), Multifamily Impact Council (MIC), and the National Leased Housing Association (NLHA)—collectively our "Study Partners"—aims to fill this gap by providing a comprehensive evaluation of the relationship between the provision of resident services and several measures of financial performance.[11]

1.1 Background

In Spring 2022, SAHF engaged Abt to review existing research and identify potential new research pathways that could provide empirical evidence of the impact of resident services on property financial performance.[12] This work was conducted in three phases, summarized in Exhibit 1-1 and described below.

Exhibit 1-1: Phases of Resident Services – Property Financial Performance Research

Phase of Work *(Date Carried Out)*	Description of Efforts
1. Discovery *(Spring-Summer 2022)*	• Exploratory work summarizing existing research • Developing initial theories of causal relationships (logic model) • Identifying possible data elements and sources
2. Design *(Spring-Summer 2023)*	• More detailed work building on the Discovery phase to refine causal pathways • Review data/fine-tune the research study design • Pilot study with 32 properties across 5 organizations • Collaboration between Study Partners (SAHF, HPN, NeighborWorks, MIC, and NLHA) to finalize study design and conduct outreach to owner/operators across all five networks
3. Implementation *(Fall 2024-Winter 2025)*	• Full study implementation • Data analysis and preliminary findings/insights • Final analysis and reporting

During the *Discovery* phase of the research, Abt conducted a literature review and developed a base logic model, i.e., a graphic representation of how offering resident services coordination should, in theory, impact the financial performance of affordable housing properties.[13] The logic model hypothesizes that the coordination and provision of resident services can help improve residents' financial stability and improve health and wellness, enhance resident satisfaction, and increase community cohesion. In theory, these improvements will translate into favorable property-level outcomes, such as better property

Positive Impact of Family Resident Services on Property Financial Performance in Selected Mercy Housing Family Properties Over Two Years. (Mercy Housing and Enterprise Community Partners, 2010).

[11] For descriptions of these Study Partners, see Appendix A.

[12] The literature review is summarized in *the 2022 Abt Associates Research Matrix on Resident Services Impact*, available at https://sahfnet.org/resources/2022-abt-associates-research-matrix-resident-services-impact.

[13] The *Discovery* phase sketched out a base logic model based on research literature on the impact of resident services and from exploratory conversations with seven affordable housing providers and four investors. To refine this preliminary logic model, we then conducted three guided focus groups comprised of resident services and finance staff from 14 affordable housing organizations. Using feedback from these discussions, we updated the base logic model and held a final confirmatory focus group with these participants to validate the revised logic model.

maintenance, increases in on-time rent payments and lower rates of eviction and turnover, which in turn will contribute to overall improvements in the financial health of the property (for the full logic model, see Appendix B). Based on this work, Abt also developed a preliminary research design that could test the hypothetical impacts as laid out in the logic model.

During the *Design* phase, we conducted a small pilot study to better understand the types and quality of available data.[14] We used this information to update the preliminary research design, including refining the sampling strategy, data collection approach, data elements and measures, and the analytic models in our preliminary research design. The pilot also included preliminary tests of the hypothesized causal pathways from resident services to property-level outcomes as laid out in the logic model. Initial analyses focused on what we considered to be the primary financial outcome of interest: *Net Operating Income* (NOI). Despite high variability in the test data and a limited set of property-level controls, we did find a positive and statistically significant relationship between the coordination and provision of resident services and NOI.[15]

SAHF worked with the other Study Partners to aggregate a list of potential owner/operators across all five networks to ensure representation and engagement across the affordable housing field; and supported Abt in conducting broad outreach and recruitment for potential participation in the study.

1.2 This Report

This report provides a detailed description of the *Implementation* phase, which builds on the foundational work conducted during the discovery and design stages. The remainder of the report is structured as follows:

- Section 2 provides a detailed description of the methodology, including sampling approach, data collection, and model specifications.
- Section 3 presents the results from the analyses, including simulations to help with interpretation of findings and study limitations.
- Section 4 discusses the results and suggests future research to inform policy and practice.

[14] We conducted an in-depth data quality review to understand what data will be available for the potential study, how they are best extracted from organizations' systems, and any pitfalls in interpreting these data. We collected data on 32 properties (17 with and 15 without services) from five organizations for the years 2014 to 2019. Of these five organizations, four were SAHF member organizations.

[15] Lagging independent variables and controlling for the presence of federal housing subsidies and median tenant household income, we found that the presence of resident services at a property was associated with a $205 per unit higher NOI. In addition, the preliminary tests found positive and significant relationships between NOI and two measures of service dosage. An increase of one FTE hour in resident services staffing was associated with a $472 per unit increase in NOI. An increase of $10,000 in resident services spending was associated with a $662 per unit increase in NOI. Note that these estimates are not part of a fully specified model and subject to change. While this analysis was limited, both in terms of the number of organizations that provided and the degree to which we were able to control for other factors, these estimates provided some preliminary evidence to support the favorable impact of resident services on financial performance.

2. Methodology

This section provides an overview of the study's methodology, including sample selection, data collection and analytic approach.

2.1 Overview

The overall research question for this analysis is the following: *What is the impact of providing resident services on the financial health of affordable rental properties?* To answer this question, we employed a quasi-experimental design to compare the financial performance of affordable rental properties with resident services (i.e., "service-enriched" properties) to similar properties without resident services (i.e., "non-enriched" properties). Specifically, we compare 17 indicators of financial performance of service-enriched properties during 2015 through 2019 to a comparison group of non-enriched properties during the same time-period using ordinary least squared (OLS) regression analysis.[16] To ensure our comparison group of non-service-enriched properties was similar to our properties with service enrichment, we relied on random sampling clustered within affordable housing organization's portfolios to select our service-enriched and non-enriched comparison groups.[17] This approach aimed for a balanced sample of service-enriched and non-enriched properties with both groups reflecting diversity across factors that could influence whether or not a property provides services. In addition to comparing the financial performance of properties with and without resident services, we conduct exploratory analyses comparing properties with different "dosages" of resident services, as proxied by the number of full-time staff dedicated to and the cost per unit spent on resident services.

2.2 Quasi-Experimental Design

The optimal way to estimate whether there is a causal relationship between resident services and financial performance would be through a randomized experiment or randomized-controlled trial (RCT), where researchers would randomly assign properties to either provide or not provide resident services. Random assignment would help ensure the two groups were similar in all ways except for the provision of resident services and, consequently, differences in the financial performance between the two groups could be attributed to resident services. However, affordable housing properties operate within complex organizational and regulatory environments, making the prospect of an RCT extremely time and resource intensive. Because conducting an RCT was not feasible, we leveraged existing administrative and financial data from 248 properties across 19 affordable housing organizations to construct a quasi-experimental design that provides the best estimate of a causal impact of resident services.

Our approach uses administrative data from 2015 to 2019 to compare 156 properties with resident services to 92 properties without services. To arrive at our sample, we employ a modified matched sampling strategy within organization portfolios, creating groups of treatment and comparison properties with similar distributions of characteristics that could influence financial outcomes (e.g., property size, affordability mix, target population). This design reduces selection bias by controlling for observable differences between groups, while regression-based adjustments further account for residual confounding factors. Although quasi-experimental designs cannot fully eliminate unobserved bias, they are frequently

[16] Because of service provision data constraints and our desire to avoid the disruptive influence of the pandemic, it was not feasible to employ a study design that included both pre- and post-COVID data.

[17] In order to have a sample that was representative of the universe of multi-family affordable housing providers, we worked with our Study Partners to identify a comprehensive listing of these affordable housing organizations that provide resident services in some portion of their portfolio. We used this list to create a sampling frame.

used as alternatives to RCTs and are generally considered the next-best approach for estimating program impacts in real-world settings where randomization is not possible.

2.3 Sampling and Data Collection Overview

We used a multi-stage approach to select properties and collect data for the study:

1) ***Stage 1. Development of sampling frame***: In the first stage, we worked with SAHF and our other four Study Partners to identify housing networks supporting improved resident outcomes. We then developed a combined list of member organizations from these networks.
2) ***Stage 2. Sampling and recruitment of organizations:*** In the next stage, we stratified organizations by whether they provided resident services and used a cluster probability sampling approach, with organizations as the primary sampling cluster.[18] For those organizations that were selected, we collected an initial set of data on their property portfolio from 2015 to 2019.
3) ***Stage 3. Property selection:*** In the final stage, we used the portfolio data from Stage 2 to screen out properties that: 1) had 40 or fewer units; 2) had a large proportion of their units comprised by Permanent Supportive Housing (PSH) units;[19] 3) had third party management of resident services; and 4) had had any large capital expenses during the years of the analysis.[20] From the remaining properties, we randomly selected properties with and without resident services and collected more detailed data from these properties.[21]

Exhibit 2-1. Sampling and Data Collection Overview

Sampling

Participants: Affordable housing organizations that are members of housing networks that support improved resident outcomes.

Method: Cluster probability proportional to size sample of organizations and their properties stratified by presence of resident services.

Target sample size: 25 organizations; 125 service-enriched properties; 125 non-enriched properties.

Actual sample size: 19 organizations; 156 service-enriched properties; 92 non-enriched properties.

Data Collection

Initial data collection on address, units, year built, number and proportion of PSH units, presence of RS, RS staffing needed from all sample organizations for property sample selection. (Fall 2024-Present).

Full data collection on property characteristics, property financials, and tenant characteristics extracted from provider MIS via data collection template. (Spring 2025-Fall 2025).

[18] To ensure that the sample reflected the relative scale of different organizations, the selection was probability proportional to organization size (i.e., organizations with more properties had a higher likelihood of being selected).

[19] Specifically, we eliminated those properties that categorized their property type as "Permanent Supportive Housing (PSH), other special needs population" and/or that had 20 percent or more of their units designated as PSH.

[20] We made these property sample restrictions to eliminate the potential for these characteristics to obscure the true effect of resident services given that their impact on financial outcomes might be difficult to effectively and efficiently model. In particular, smaller properties and properties with recent large capital expenses likely exhibit more volatile and extreme financial characteristics whereas properties with high rates of PSH and those whose resident services are managed by a third party are likely operating with different infrastructure and motives than those without. However, in an effort to retain three organizations and their properties in our analysis, we did relax the restriction on the minimum number of units and properties with fewer than 40 units.

[21] Properties were randomly selected based on their 2019 resident service status. Organizations that lacked sufficient variability in resident services provision, i.e. had fewer than two properties with or without services, were still sampled but were only included in our exploratory analyses.

For more details on sampling and data collection, see Appendix C.

Exhibit 2-2 presents sample characteristics for all 248 properties in the sample, as well as for subsamples of these properties with and without services. Characteristics include region, property size, target population, subsidy, type of resident services provided, [22] and resident services budget category. For non-fixed property characteristics, we present data on the most recent year in our model.[23]

Exhibit 2-2 Sample Characteristics (2018)

		All Properties	Properties with RS	Properties without RS
	Sample Size (N)	248	156	92
Region	Northeast & Islands	25%	24%	28%
	Midwest	12%	6%	22%
	South	22%	22%	21%
	West	41%	47%	29%
Property Size	1-50 units	21%	19%	24%
	51-100 units	41%	39%	45%
	101-250 units	26%	31%	18%
	251+ units	12%	11%	13%
Property type/Target population [a]	Senior	36%	40%	30%
	Family/Unrestricted	51%	49%	54%
Subsidies [b]	LIHTC	57%	62%	48%
	Project Based Section 8	34%	34%	35%
	State Local Subsidy	19%	23%	11%
	PRAC	4%	4%	5%
	PBV	7%	4%	11%
Permanent Supportive Housing (PSH) [c]	Property has PSH units	2%	3%	2%
Type of resident services [b]	Housing Stability	41%	72%	0%
	Financial Health	40%	70%	0%
	Health	44%	78%	0%
	Community Engagement	45%	81%	0%
	Youth	21%	39%	0%

[22] Our data provides information on whether a given property provides resident services in each of five categories: 1) Housing Stability; 2) Financial Health,; 3) Health; 4) Community Engagement; and 5) Youth Programs, Housing Stability refers to programs geared at enhancing the housing stability or eviction prevention of residents, such as rental assistance, rent repayment, lease education, or other programs with the goal of helping tenants remain stably housed. Financial Health refers to programs or services related to financial stability (beyond housing stability), such as financial coaching, budgeting, credit counseling, employment, or career services. Health programs refer to programs or services related to health and wellness. Community programs relate to community engagement. Youth programs refer to programs for youth.

[23] While our data spans from 2015-2019, we only use 2019 outcome data since our models use lagged data for all other measures. Thus, the sample characteristics in Exhibit 2-2 are based on 2018 data.

		All Properties	Properties with RS	Properties without RS
RS Expense Budget Category [b]	Corporate	31%	64%	0%
	Government	19%	39%	0%
	Operating	42%	78%	0%
	Philanthropy	21%	43%	0%
	Other Expense	20%	40%	0%

Notes: Sample is 248 properties across 19 member organizations.
[a] Columns do not sum to 100% due to missing information.
[b] Columns do not sum to 100% because categories are not mutually exclusive.
[c] Because of our screening criteria, no property in our sample has 20% or more of their units comprised of PSH.

In 2018, 156 (63%) of properties in our sample had resident services vs 92 (37%) that did not. Properties with services differed somewhat from those without services along several dimensions, including region, property size, target population and subsidy type. Specifically, in our sample properties with services were more concentrated in the West and less in the Midwest, tend to be a bit larger in size, and had a higher share that target seniors. While the percentages of properties with Permanent Supportive Housing (PSH) units[24] and those using Project Based Section 8 and Project Rental Assistance Contract (PRAC) subsidies were similar between service-enriched and non-enriched properties, service-enriched properties were more likely to use LIHTC and state and local subsidies and less likely to use project-based vouchers (PBV) than non-enriched properties.[25] Our analyses account for these differences through the use of adjustments to financial outcome measures and control variables (see Sections 2-5).

Among properties that provided resident services in 2018, community engagement and health services were the two most common categories of services, followed by financial health and housing stability services. Youth services were the least common services provided.

Service-enriched properties relied on a wide variety of funding sources for these services, including operating funds. Seventy-eight percent of service-enriched properties used operating funds, 64% used corporate funds, 43% used philanthropic funds, and 39% used government funds[26], while 40% used other types of funds. Importantly, many properties relied on a blend of funds to support resident services.[27]

2.4 Analytic Dataset

To create an analytic dataset to model the relationship between resident services and financial performance, we combined the property-level data collected from participating organizations with data

[24] Though our screening criteria eliminated most properties with PSH units, four service-enriched and two non-enriched properties with PSH units were included.

[25] It is worth noting that the subsidies are not mutually exclusive and most properties in the sample have more than one subsidy.

[26] Government funding includes government grants or contracts, including but not limited to HUD grants.

[27] This does not include corporate-level expenditures for resident services that may cross multiple properties or entire portfolios.

from American Community Survey (ACS)[28] and the Bureau of Economic Analysis (BEA).[29] From this combined data, we constructed three categories of measures:

- ***Treatment measures***: The primary "treatment" measure is a binary (or "dummy") variable to indicate whether the property provides resident services or not.[30] We also construct two treatment measures to reflect the "dosage" of resident services: 1) the total dollars per unit spent on resident services; and 2) the number of property staff (per 100 units) dedicated to resident services, measured in full-time equivalencies (FTEs).

- ***Financial outcome measures***: The analytic dataset includes measures of 17 property-level financial measures, categorized into seven outcome "domains". All outcomes are normed as a percentage difference from the average within a member organization. Additionally, all dollar-based outcome measures are adjusted using a regional price parity and scaled to per-unit amounts prior to norming.[31]

- ***Control measures***: Finally, the analytic dataset includes binary variables for each organization and several other measures reflecting property characteristics and the characteristics of the census tracts in which they are located.

Exhibit 2-3, below, provides an overview of this analytic dataset. For descriptive statistics on these key variables, see Appendix D.

Exhibit 2-3. Key Variables in Analysis Dataset

Type of Information	Key Variables
"Treatment" measures	
Provision of resident services	Resident services dummy variable, where a value of 1 = presence of resident services and 0 = absence of resident services.
Dosage of resident services	Total dollars spent on resident services per unit
	Number of full-time equivalent (FTE) staff dedicated to resident services per 100 units
Financial outcome measures ***All financial outcome measures are regionally adjusted and normed to the average for its member organization*	

[28] We use the ACS to collect information on the characteristics of the neighborhoods in which the properties are located (specifically, census tract-level data on poverty rate and median rent).

[29] We use BEA's Regional Price Parity (RPP) indices to normalize financial outcomes because our properties span multiple states with very different cost structures. Without this adjustment, comparisons of resident service costs would reflect nominal differences rather than real purchasing power. RPP provides a standardized way to account for regional price variation, including housing costs. This analysis more accurately captures the true economic impact of services and aligns with recognized federal benchmarks. By adjusting for RPP, we can interpret service effectiveness equitably and make better-informed decisions about resource allocation across diverse markets

[30] For this dummy variable and others, a value of 1 indicates the presence of a condition and 0 indicates the absence of the condition.

[31] To adjust for the wide variation in the financial outcome measures across and within member organizations' properties, we "norm" each outcome by calculating its percentage difference its organization's average value for that year. For example in 2019, if a given property's NOI per unit was $5,000 but the average NOI per unit for its organization is $4,000, that property's NOI value would be translated to ($5,000-$4,000)/$4000 (or 0.25), reflecting the fact that its NOI per unit is 25 percent higher than the average value for its organization for that year. For more on this norming, see Section 2.5.

Type of Information	Key Variables
Domain 1	Net Operating Income (NOI)
	Controllable NOI (CNOI)[32]
	CNOI minus RS expenses
Domain 2	Total Revenue
	Total Revenue minus external RS funding
	Total Contract Rent Revenue
Domain 3	Total Non-RS Expenditures
Domain 4	Rent Receivables
	Total Arrears
	Bad Debt
	Vacancy Loss
Domain 5	Legal Expenses
	Maintenance Expenses
	Security Expenses
Domain 6	Turnover Rate
Domain 7	Percent of Contract Rent Collected
	Percent Tenant Portion of Rent Collected
Control measures	
Organization-specific variables	Nineteen dummy variables, one for each of the participating organizations, where a value of 1 means the property is part of that organization's portfolio and a value of 0 means the property is not part of that organization's portfolio.
Property characteristics	Six binary variables reflecting presence of the following subsidies: LIHTC, Project-based Section 8, State/local subsidies, PRAC, and PBV
	One dummy variable to reflect if the property has PSH units
	Building age
	Target population= Senior (restricted) or Family (unrestricted)
	Number of units
Census Tract characteristics	Poverty rate
	Median rent

Exhibit 2-4, below, summarizes the hypothesized relationships between our three treatment measures and the 17 financial outcomes in our analytic dataset.

[32] Controllable net operating income (CNOI) is equal to net operating income excluding property taxes, capital expenses, and insurance expenses.

Exhibit 2-4. Hypothesized impacts of resident services

Outcome Domain	Financial Performance Outcome	Hypothetical impact of resident services
1	• Net Operating Income (NOI) • Controllable NOI (CNOI) • CNOI minus external RS expenses	Higher in properties: • with resident services (vs without resident services) • with more (vs fewer) staff resident service hours • with more (vs fewer) dollars/unit spent on resident services
2	• Total Revenue • Total Revenue minus external RS Funding • Total Contract Rent Revenue	Higher in properties: • with resident services (vs without resident services) • with more (vs fewer) staff resident service hours • with more (vs fewer) dollars/unit spent on resident services
3	• Total Non-RS Expenditures	Lower in properties: • with resident services (vs without resident services) • with more (vs fewer) staff resident service hours • with more (vs fewer) dollars/unit spent on resident services
4	• Rent Receivables • Total Arrears • Bad Debt • Vacancy Loss	Lower in properties: • with resident services (vs without resident services) • with more (vs fewer) staff resident service hours • with more (vs fewer) dollars/unit spent on resident services
5	• Legal expenses • Maintenance expenses • Security expenses	Lower in properties: • with resident services (vs without resident services) • with more (vs fewer) staff resident service hours • with more (vs fewer) dollars/unit spent on resident services
6	• Turnover Rate	Lower in properties: • with resident services (vs without resident services) • with more (vs fewer) staff resident service hours • with more (vs fewer) dollars/unit spent on resident services
7	• Percent of Contract Rent Collected • Percent Tenant Portion of Rent Collected	Higher in properties: • with resident services (vs without resident services) • with more (vs fewer) staff resident service hours • with more (vs fewer) dollars/unit spent on resident services

2.5 Analytical Models

To estimate the relationship between resident services and financial performance we conducted three sets of OLS regressions. Each set focuses on one of the resident service treatment measures and uses that measure as an independent variable as described in Exhibit 2-5.

Exhibit 2-5. Independent (Treatment) Variable by Regression Set

	Set 1	Set 2	Set 3
Independent (Treatment) Variable	**Has resident services (binary variable)**	**Dollars/unit spent on resident services**	**Number of FTE staff dedicated to resident services**

Within each set, there are 17 separate regressions, one for each the 17 financial performance outcomes. Each regression uses one financial performance outcome as the dependent variable and uses the following basic specification:

$$Y_{it} = \beta_0 + \beta_1 X_{i(t-1)} + \mu' Z_{i(t-1)} + \alpha_i + \delta_t + \varepsilon_{it}$$

Where:

- Y_{it} = normed, regionally adjusted financial outcome for organization i in year t
- $X_{i(t-1)}$ = a given resident service "treatment" variable (binary or continuous) for organization i in the prior year $t-1$
- $Z_{i(t-1)}$= a vector of observed covariates in the prior year: subsidy indicators, building age, occupancy type, size (i.e., number of units), poverty rate (tract level), median rent (tract level)
- α_i = member organization fixed effects
- δ_t = year fixed effects
- ε_{it} = error term

To isolate the effect of treatment on property-level financial outcomes, we normed the outcome within each organization and included organization fixed effects in the model. Norming adjusts the scale of the outcome so that it reflects performance relative to the organization's own average, removing cross-organization differences in baseline financial levels and improving interpretability. Organization fixed effects then control for all time-invariant organizational characteristics that could confound the treatment effect. Together, these steps ensure that identification relies on within-organization variation across properties over time, allowing us to estimate how treatment changes a property's financial performance relative to its organization's typical level while accounting for unobserved organizational factors. Treatment variables and other covariates are lagged to the prior year to ensure predictors precede the

outcome, reducing simultaneity bias and reverse causation. We address missing data on control variables using mean imputation combined with missing-value indicators.[33]

2.6 Model Categorization

To help maintain the integrity of the interpretation of statistical tests, we categorize the analyses as "primary", "secondary" and "exploratory."[34] This categorization helps mitigate problems posed by multiple hypothesis testing by prioritizing analyses that are most important to the study and treating others as important but less definitive.[35] It also allows for greater focus on analyses where there is more confidence in the quality of data.

Within Set 1, we identified Regression 1 as the primary analysis, because of NOIs the central importance of NOI as an indicator of financial performance. All other regressions within Set 1 are categorized as *secondary*, providing important information about the mechanisms through which the presence of resident services may impact NOI. We consider all analyses within Sets 2 and 3 to be exploratory given that: 1) our foundational research during the Discovery and Design phases did not focus on dosage; 2) our quasi-experimental design stratifies properties based on the presence (or absence) of resident services (and not on the dosage of services); and 3) we have some concerns about the quality of data used to construct our measures of dosage (for more on these concerns, see Section 3.3). Exhibit 2-6, below, summarizes our categorizations.

Exhibit 2-6. Categorization of Analyses

Set/ Treatment	Regression/ Financial Performance Outcome	Category
Set 1 Has resident services (binary variable)	*Regression 1* NOI	Primary
	Regressions 2-17 All other financial performance outcomes	Secondary
Set 2 Dollars/unit spent on resident services	*Regressions 1-17* All financial performance outcomes	Exploratory
Set 3 Number of FTE staff dedicated to resident services	*Regressions 1-17* All financial performance outcomes	

For each regression, an organization needed to have at least four properties with the financial performance outcome and the treatment data for a given year for any of its properties to be included for that year.[36] In addition, for Set 1, organizations needed to have at least two properties with resident services and two

[33] Mean imputation replaces missing values with the variable's observed mean, ensuring a complete dataset and avoiding loss of observations. To retain information about missingness, we create dummy variables ("missing flags") for each imputed variable. This approach helps maintain sample size while allowing models to account for potential systematic differences between observed and imputed cases.

[34] Given the large number of hypothesis testing that we conduct, there is a high likelihood that at least some will show a significance purely as a result of chance. By identifying which analyses we consider to be of higher importance a priori, we are able to limit the risk of false positives.

[35] In these types of analysis categorizations, "primary" analyses are sometimes referred to as *confirmatory* analyses.

properties without resident services in a given year in order to have any of its properties included in that year.

Exhibit 2-7, below, shows the total number of organizations and properties included for each year for the primary analysis that estimates the relationship between the provision of resident services and NOI.

Exhibit 2-7. Number of organizations and properties included in primary analysis [a]

Year	Primary Analysis	
	# of organizations	# of properties
2016	9	87
2017	11	107
2018	14	128
2019	15	163
Any year	16[b]	167

Notes:

[a] The numbers of organizations and properties vary by year because: 1) we sampled properties based on 2019 data but not all properties had historical data for all years; and 2) some properties were acquired by member organizations during the study period.

[b] We excluded three organizations from the primary analysis because they did not have the minimum number of properties with and without services.

Appendix E provides information on the total number of properties and observations for all regressions across all three sets of analyses. We note that, due to data collection challenges, these numbers are significantly lower for regressions estimating the impact of resident services on the following four outcome variables: *total arrears, turnover rate, percent of contract rent collected*, and *percent tenant portion of rent collected*. This results in a decreased ability to detect significant impacts of resident services for these outcomes.

3. Findings

This section presents the hypothesized relationships between resident services and financial performance based on the results of the OLS regressions.

Key Findings:

- Our **primary analysis** supports the hypothesis that providing resident services has a favorable impact on the "bottom-line" financial performance of properties. We find a positive and significant association between the presence of resident services and net operating income (NOI).
- Our **secondary analyses** show some support for the hypothesized impacts of resident services on property financial performance. These analyses estimate relationships between the provision of resident services and three financial performance outcomes (i.e., total revenue, total arrears, and bad debt) that are statistically significant and in the hypothesized direction, most are either not statistically significant, or are counter to the expected direction of impact.
- Our **exploratory analyses** show mixed support for the hypothesized impacts of the "dosage" of resident services on financial performance.
  - The estimated associations between dollar spent on resident services per unit and several financial (but not all) performance outcomes are statistically significant and in the hypothesized direction.
  - We find little evidence of a statistically significant relationship between the number of FTE staff dedicated to resident services and any of the financial performance outcomes.

3.1 Presence of Resident Services

Exhibits 4-1 and 4-2 present the treatment variable coefficients from the 17 Set 1 regressions. These coefficients estimate the relationship between the provision of resident services in a given year and financial performance outcomes the following year and are suggestive evidence of an impact of resident services on financial performance.

Primary Analysis

The coefficient from our ***primary analysis*** shows a positive and statistically significant impact of the provision of resident services on NOI. Specifically, the provision of resident services is associated with the property earning 26% more NOI than the average property within the same organization, all else equal. [37]

[37] The coefficient on the Project-based Section 8 dummy variable is positive and significant, while the coefficient on the LIHTC dummy variables is negative and significant. These are consistent with expectations of the relationships between these subsidies' funding models and NOI. For more details of the results from these regressions, see Appendix F.

Exhibit 4-1 Estimated Impacts of Presence of Resident Services on NOI, 2016-2019

Model Category	Regression Model	Treatment = Has Resident Services (binary) Coefficient Estimate	Total Number of Observations [a]
Primary	*Regression 1.* **Dependent Variable = NOI**	0.26**	485

Significance: ** = 99% confidence level; * = 95% confidence level; + = 90% confidence level

[a] In the regression model, there is one record for each property-year observation. For example, if Property A is in our sample for each year 2016-2019, then there will be four records for that property whereas if Property B is only in the sample for 2018 and 2019, then there are only two records for that property. The number of records varies by regression because of missing data for outcomes.

Secondary Analyses

Our ***secondary analyses*** estimate a positive and statistically significant impact of the provision of resident services on total revenue and a negative and statistically significant impact on total arrears and bad debt. These estimates are consistent with our hypotheses related to the impact of resident services on these three financial performance outcomes. However, our secondary analyses produce estimates that are contrary to hypotheses related to the impact of resident services on several expense-related outcomes. Specifically, whereas we hypothesized that resident services would lead to lower non-RS expenses, we find a positive and statistically significant association between the provision of resident services and total non-RS expenditures, maintenance expenses, and security expenses. We do not find a statistically significant impact of resident services on legal expenses or any of the other 9 financial performance outcomes not identified above.

Exhibit 4-2 Estimated Impacts of Presence of Resident Services on Other Financial Outcomes, 2016-2019

Model Category	Regression Model	Treatment = Has Resident Services (binary) Coefficient Estimate	Total Number of Observations [a]
Secondary	*Regression 2.* **Dependent Variable = CNOI**	0.03	365
	Regression 3. **Dependent Variable = CNOI minus RS expenses**	0.06	243
	Regression 4. **Dependent Variable = Total Revenue**	0.10*	419
	Regression 5. **Dependent Variable = Total Revenue minus RS Funding**	-0.01	311
	Regression 6. **Dependent Variable = Total contract rent revenue**	0.03	418
	Regression 7. **Dependent Variable = Total non-RS expenditures**	0.16**	407

Model Category	Regression Model	Treatment = Has Resident Services (binary) Coefficient Estimate	Total Number of Observations [a]
	Regression 8. **Dependent Variable = Rent receivables**	0.12	349
	Regression 9. **Dependent Variable = Total arrears**	-0.38+	312
	Regression 10. **Dependent Variable = Bad debt**	-0.24+	432
	Regression 11. **Dependent Variable = Vacancy loss**	0.01	435
	Regression 12. **Dependent Variable = Legal expenses**	-0.07	396
	Regression 13. **Dependent Variable = Maintenance expenses**	0.13**	447
	Regression 14. **Dependent Variable = Security expenses**	0.49**	371
	Regression 15. **Dependent Variable = Turnover rate**	0.01	312
	Regression 16. **Dependent Variable = Percent tenant portion of rent collected**	0.07	214
	Regression 17. **Dependent Variable = Percent of contract rent collected**	0.00	214

Significance: ** = 99% confidence level; * = 95% confidence level; + = 90% confidence level

[a] In each regression model, there is one record for each property-year observation. For example, if Property A is in our sample for each year 2016-2019, then there will be four records for that property whereas if Property B is only in the sample for 2018 and 2019, then there are only two records for that property. The number of records varies by regression because of missing data for outcomes.

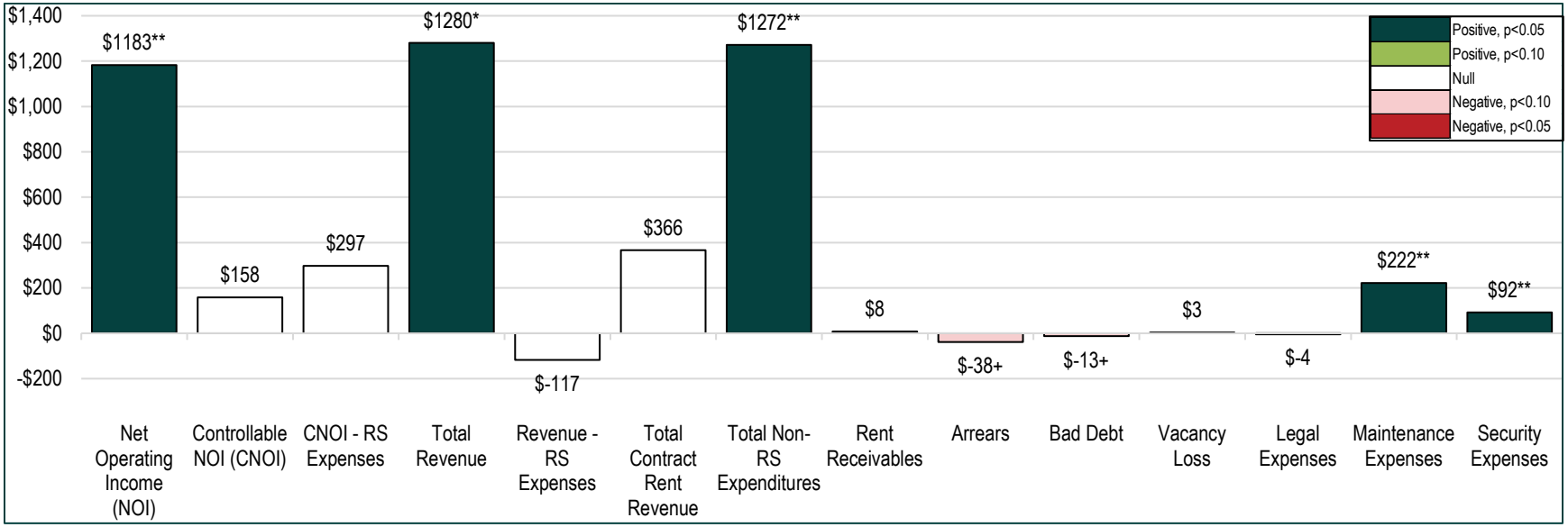
Simulations

To help understand the magnitude of these impacts, we apply the model coefficients from our primary and secondary analyses to the mean value of each of the dollar-based financial outcomes.[38] These simulations translate the coefficients to an estimate of the average dollar value per unit in a given year of providing resident services in the prior year.

[38] We do not present total dollar value impact simulation for turnover rate, percent tenant portion of rent collected, or percent of contract rent collected, given these three outcomes are rates (not dollar values). Therefore, unlike the other financial performance outcomes, the products of the coefficient estimates and the average values for these outcomes do not produce total dollar value impact estimates.

Exhibit 4-3 provides the results of these simulations. Based on our primary analysis, providing resident services results in an estimated average increase of $1,183 in NOI per unit the following year. While the provision of resident services is associated with significant reductions in arrears and bad debt, with rather large coefficients, the dollar value of these reductions is actually small (-$38 and -$13, respectively), due to the relatively low average dollar values of arrears and bad debt.

Exhibit 4-3. Average dollar impact per unit in a given year of providing resident services in the prior year, 2016-2019



Significance: ** = 99% confidence level; * = 95% confidence level; + = 90% confidence level

3.2 Impact of Resident Service Dosage

In this section we present the results from the 34 regressions in Sets 2 and 3 (17 regressions in each), which examine the relationship between the dosage of resident services and financial performance**.** These analyses show mixed support for the hypothesis that "more" resident services (as measured by more staff dedicated to resident services per unit and more money spent on resident services per unit) improves property-level financial performance.

Exploratory Analyses: Impact of Resident Service Expenditures

Exhibit 4-4 presents the treatment variable coefficients from our Set 2 regressions. These coefficients estimate the relationship between the dollars per unit spent on resident services in a given year and financial performance outcomes the following year and are suggestive of the impact of spending more on resident services on financial performance.

These analyses produce positive and significant estimates for all of the outcomes related to operating income (i.e. NOI, CNOI, and CNOI minus RS funding and expenses) and revenue (total revenue, revenue minus external RS funding, and total contract rent revenue), consistent with hypothesized impacts. However, the estimates for the impact of RS expenditures on three expense-related outcomes (total non-RS expenditures, maintenance expenses, and security expenses) are positive and significant, while the estimate for percent of tenant portion of rent collected is negative and significant, all of which are contrary to the hypothesized relationships. We do not find a statistically significant impact of resident services on the other financial performance outcomes.

Exhibit 4-4 Estimated Impacts of Dollars/Unit Spent on Resident Services on Financial Performance Outcomes, 2016-2019

Model Category	Regression Model	Treatment = Dollars/unit spent on resident services Coefficient Estimate	Total Number of Observations[a]
Exploratory	*Regression 1.* **Dependent Variable = NOI**	0.06**	676
	Regression 2. **Dependent Variable = CNOI**	0.04**	544
	Regression 3. **Dependent Variable = CNOI minus RS expenses**	0.33*	539
	Regression 4. **Dependent Variable = Total Revenue**	0.03**	609
	Regression 5. **Dependent Variable = Total Revenue minus RS Funding**	0.01+	604
	Regression 6. **Dependent Variable = Total contract rent revenue**	0.02**	605
	Regression 7. **Dependent Variable = Total non-RS expenditures**	0.03**	600

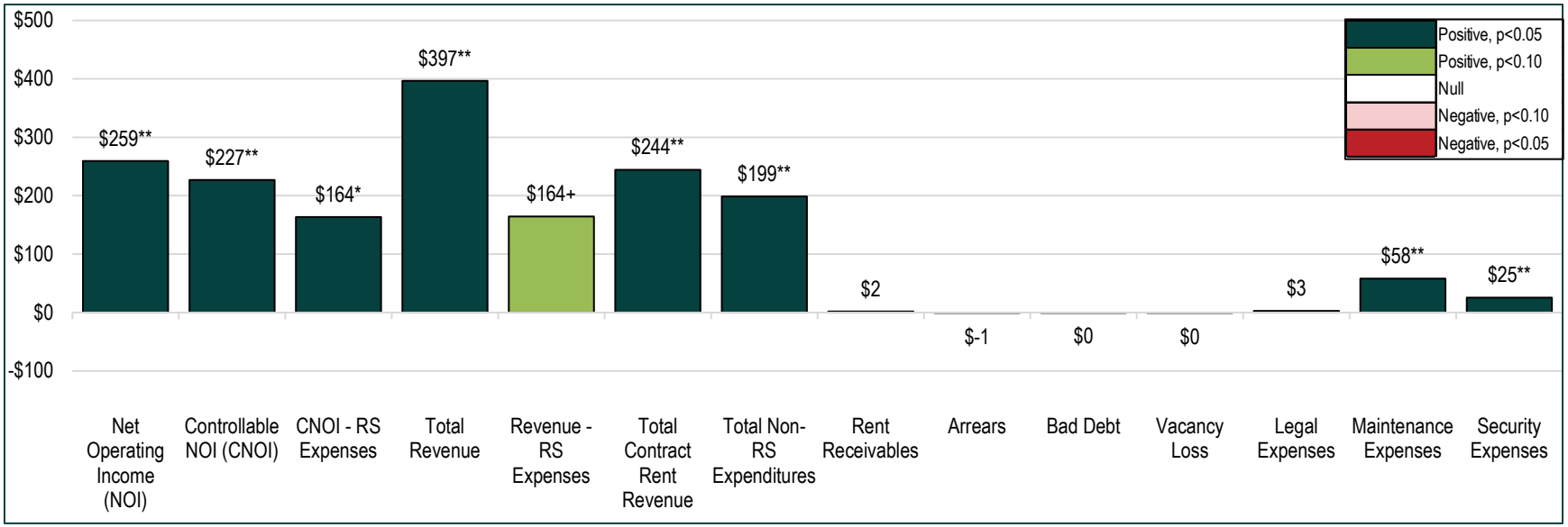
	Regression 8. **Dependent Variable = Rent receivables**	0.03	516
	Regression 9. **Dependent Variable = Total arrears**	-0.01	297
	Regression 10. **Dependent Variable = Bad debt**	-0.00	600
	Regression 11. **Dependent Variable = Vacancy loss**	-0.00	605
	Regression 12. **Dependent Variable = Legal expenses**	-0.05	544
	Regression 13. **Dependent Variable = Maintenance expenses**	0.03**	605
	Regression 14. **Dependent Variable = Security expenses**	0.14**	542
	Regression 15. **Dependent Variable = Turnover rate**	-0.01	297
	Regression 16. **Dependent Variable = Percent tenant portion of rent collected**	-0.02*	186
	Regression 17. **Dependent Variable = Percent of contract rent collected**	0.00	186

Significance: ** = 99% confidence level; * = 95% confidence level; + = 90% confidence level

[a] In regression models, there is one record for each property-year observation. For example, if Property A is in our sample for each year 2016-2019, then there will be four records for that property whereas if Property B is only in the sample for 2018 and 2019, then there are only two records for that property. The number of records varies by regression because of missing data for outcomes.

Exhibits 4-5 applies the above coefficient estimates to the average value of each dollar-based financial outcome. These simulations translate the coefficients to the average dollar value per unit in a given year associated with spending an additional $100 per unit on resident services in the prior year.

Exhibit 4-5. Average dollar impact per unit in a given year associated with spending additional $100/unit on resident services in the prior year, 2016-2019



Significance: ** = 99% confidence level; * = 95% confidence level; + = 90% confidence level

Exploratory Analyses: Impact of Resident Service Staffing

Exhibit 4-6 presents the treatment variable coefficients from our Set 3 regressions. These coefficients estimate the relationship between the number of FTEs dedicated to resident services per 100 units in a given year and financial performance outcomes the following year and are suggestive of the impact of additional RS staffing on property financial performance.[39]

While the estimate of the impact of more staff on arrears is negative and statistically significant (i.e., consistent with our hypothesis), the estimate of the impact on total non-RS expenditures is positive and significant, which is contrary to our hypothesis. All other estimates are not statistically significant.

Exhibit 4-6. Estimated Impacts of FTE Staff per 100 units dedicated to Resident Services on Financial Performance Outcomes, 2016-2019

Model Category	Regression Model	Treatment = Number of FTE Staff Dedicated to Resident Services/100 units Coefficient Estimate	Total Number of Observations
Exploratory	*Regression 1.* **Dependent Variable = NOI**	-0.01	763
	Regression 2. **Dependent Variable = CNOI**	-0.06	609
	Regression 3. **Dependent Variable = CNOI minus RS expenses**	-0.10	558
	Regression 4. **Dependent Variable = Total Revenue**	0.02	674
	Regression 5. **Dependent Variable = Total Revenue-RS Funding**	0.02	629
	Regression 6. **Dependent Variable = Total contract rent revenue**	0.04	665
	Regression 7. **Dependent Variable = Total non-RS expenditures**	0.08*	651
	Regression 8. **Dependent Variable = Rent receivables**	0.23	587
	Regression 9. **Dependent Variable = Total arrears**	-0.46*	352
	Regression 10. **Dependent Variable = Bad debt**	0.11	677
	Regression 11. **Dependent Variable = Vacancy loss**	0.13	682
	Regression 12. **Dependent Variable =**	0.20	625

[39] Relative to the other two treatment variables, FTEs per 100 units has a lot less variation which makes it harder to detect a significant effect. See more details on treatment and outcome variable variation in Appendix D.

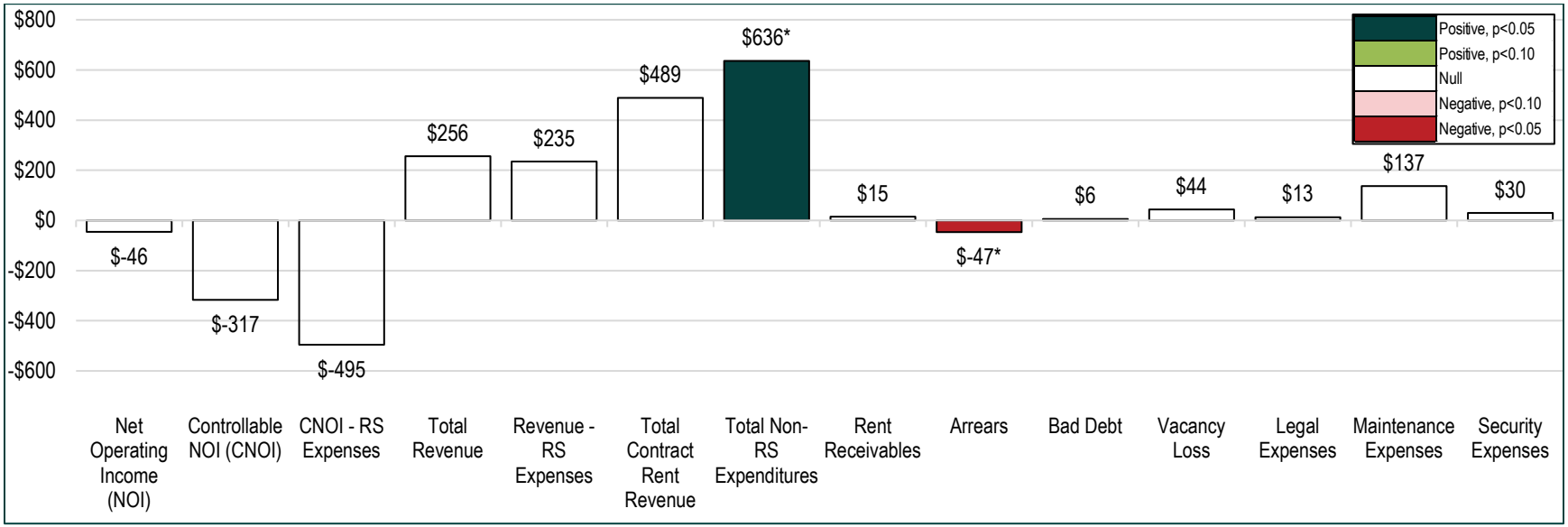
Model Category	Regression Model	Treatment = Number of FTE Staff Dedicated to Resident Services/100 units Coefficient Estimate	Total Number of Observations
	Legal expenses		
	Regression 13. **Dependent Variable = Maintenance expenses**	0.08	691
	Regression 14. **Dependent Variable = Security expenses**	0.16	622
	Regression 15. **Dependent Variable = Turnover rate**	0.23	352
	Regression 16. **Dependent Variable = Percent tenant portion of rent collected**	0.04	208
	Regression 17. **Dependent Variable = Percent of contract rent collected**	0.00	208

Significance: ** = 99% confidence level; * = 95% confidence level; + = 90% confidence level

[a] In regression models, there is one record for each property-year observation. For example, if Property A is in our sample for each year 2016-2019, then there will be four records for that property whereas if Property B is only in the sample for 2018 and 2019, then there are only two records for that property. The number of records varies by regression because of missing data for outcomes.

Exhibits 4-7 applies the above coefficient estimates to the average value of each dollar-based financial outcome. These simulations translate these coefficients to the average dollar value per unit associated with an additional full-time equivalent staff member per 100 units.

Exhibit 4-7 Average dollar impact in a given year per additional resident services FTE/100 units in the prior year, 2016-2019



Significance: ** = 99% confidence level; * = 95% confidence level; + = 90% confidence level

3.3 Summary of Alignment of Findings with Hypotheses

Exhibit 2-5, below, provides a summary of whether the findings from each of our three sets of regressions align with our hypotheses regarding the impact of resident services on financial outcomes. A green "check" (✓) signifies that the estimated impact was statistically significant and in the hypothesized direction, while a red "x" (x) signifies that the estimated impact was statistically significant but in the opposite direction from the hypothesis. A black dash mark (-) signifies that the estimated impact was not statistically significant.

Exhibit 2-5. Comparison of findings to hypothesized impacts

Outcome Domain	Financial Performance Outcome	Comparison of Findings to Hypotheses		
		Set 1 Has resident services	Set 2 Dollars/unit spent on resident services	Set 3 Number of FTE staff dedicated to resident services
1	• Net Operating Income (NOI)	✓	✓	-
	• Controllable NOI (CNOI)	-	✓	-
	• CNOI minus external RS expenses	-	✓	-
2	• Total Revenue	✓	✓	-
	• Total Revenue minus external RS funding	-	✓	-
	• Total Contract Rent Revenue	-	✓	-
3	• Total Non-RS Expenditures	x	x	x
4	• Rent Receivables	-	-	-
	• Total Arrears	✓	-	✓
	• Bad Debt	✓	-	-
	• Vacancy Loss	-	-	-
5	• Legal expenses	-	-	-
	• Maintenance expenses	x	x	-
	• Security expenses	x	x	-
6	• Turnover Rate	-	-	-
7	• Percent tenant portion of rent collected	-	x	-
	• Percent of contract rent collected	-	-	-

A ✓signifies a statistically significant impact (at a 90% confidence interval or higher) in the hypothesized direction; an x signifies a statistically significant impact in the opposite direction from the hypothesis; - signifies no statistically significant impact.

3.4 Limitations

As with all empirical research, this study has limitations that are important to consider when interpreting results and applying them to policy and practice.

Limitations of non-experimental design: While the study's quasi-experimental design—including its sampling and modeling approach—helps control for inherent differences in properties that do and do not have resident services, unobserved confounding factors may remain. That is, it is possible that the types of properties that decide to offer resident services are different from those that do not offer services in ways that we were not able to identify or control for. If these same differences are correlated with financial performance outcomes, our estimates of the relationship between resident services and financial performance will be biased.

In addition, it is possible that some of the effects we do observe are, at least in part, the result of "reverse causation," i.e., the impact of the outcome variable on the treatment variable. For example, it could be that the observed positive and significant association between the provision of resident services and NOI is the result of properties with higher NOIs having additional resources to provide resident services, as opposed to resident services resulting in higher NOIs. We have tried to limit the extent to which reverse causation is a concern by using lagged treatment variables (i.e., our models assess the relationships between the financial performance outcomes and the presence and dosage of resident services in the year *prior* to the year in which those outcomes were measured). We also ran alternative specifications of the model using a weighted two-stage model to account for differences between properties that select into having resident services and results are qualitatively similar. However, it is still possible that *expectations* of future financial performance impact decisions around the provision of services. As a result, the observed significant associations between resident services and financial performance measures cannot be interpreted as definitive causal effects.

Heterogeneity of resident services and resident service coordination: "Resident services" is an umbrella term that covers the coordination and delivery of a wide variety of programs. Different types of services, such as financial counseling, health and wellness programs, and community engagement, may have different impacts on both resident-level and property-level outcomes. This study does not differentiate between service types or examine the degree to which specific types of services have different associations with financial performance.

External validity: Our findings are specific to the property types, organizations, and time frame examined (2015–2019). They may not be generalizable to all affordable rental properties or other periods, given variations in market conditions, organizational practices, and resident needs. In fact, there are reasons to believe that resident services have changed in ways that may directly affect their impact on financial performance (for more on these changes, see Section 4).

Data limitations: The analysis relies on administrative and financial data provided by participating organizations, supplemented by external sources. Differences in the completeness of data and in reporting practices across and within organizations may introduce measurement error. While we attempted to address missing data for control variables through imputation and missing-value indicators, residual bias may remain. In addition, we did not impute data for any of our 17 financial performance outcomes. Some outcomes—such as turnover rate—had a substantial amount of missing data. Because regression models estimating the impact of resident services on these outcomes were therefore based on a relatively low number of observations, detecting significant impacts on these outcomes was more difficult.[40]

[40] While this could introduce bias if the missingness is not random, we re-ran our primary and secondary analysis among the sample of properties with turnover rate data, and results were directionally similar.

In addition, there are concerns about the quality of the data used to measure resident service expenditures and the number of full-time equivalent staff dedicated to resident services. Though, in earlier stages of this research, participating organizations felt strongly that the "dosage" of resident services has a material impact on resident outcomes, they expressed hesitancy about the reliability of the data that could be used to construct these measures, particularly data tracked at the property level during this pre-COVID time period.[41]

[41] For example, resident services are typically supported by regional and/or organization-level resident services staff that provide services, quality assurance, partnership support and oversight. Such staffing support are unlikely to be captured in a consistent way by property-level data systems. Similarly, organizations may leverage grant funding and/or contribute corporate funds to support resident service programs across multiple properties. Such organization-level resources are not always reflected in property financial statements. Finally, the quality of data tracking systems, particularly pre-COVID, was inconsistent across properties.

4. Discussion

This study provides compelling evidence to support the hypothesis that investment in resident services and coordination enhances the financial performance of affordable rental properties. Most critically, the study's primary analysis—the focal point of the research—shows a positive and statistically significant relationship between the coordination and provision of resident services and property-level NOI, a key measure of financial performance. Importantly, the relationship is not just positive and significant, but meaningful. Specifically, we estimate that service-enriched properties lead to a meaningful increase in NOI, specifically an average increase in NOI of about $1,200.[42] In addition, our secondary analyses estimate a positive and significant relationship between the coordination and provision of services and property revenue. The study's exploratory analyses also find favorable relationships between expenditures on resident services and financial outcomes related to operating income and revenue (however, as noted, there are reasons to be cautious about all of our exploratory analyses as there are concerns about the quality of this and the FTE "dosage" measures.)

Interestingly, we do not find much evidence in support of our hypotheses regarding the *mechanisms* through which resident services lead to these favorable revenue and NOI impacts. Although our secondary analyses suggests that the provision of resident services lead to lower levels of arrears and bad debt, the magnitude of these estimated impacts are quite small and we do not find evidence of favorable impact of resident services on other mediating factors that might explain the improved financial performance. In fact, in our models, the provision of and amount spent on resident services is associated with an increase rather than a decrease, in total non-resident expenditures and in maintenance and security expenses. This discrepancy may indicate that the hypothesized causal mechanisms were either misidentified or insufficiently captured by available metrics. However, it is also possible that these positive relationships are biproducts of the favorable impact of resident services on financial performance. That is, if resident services in a given year increase properties' revenue and NOI in the following year (as our estimates suggest they do), these same properties may have more resources available to spend in that following year and may decide to do so.

Importantly, there are reasons to believe that the impact of resident services on property financial performance may be stronger now than during the pre-COVID time period of this study. For example, since the pandemic SAHF and many of its member organizations have noted greater emphasis on evidence-based, data-informed approaches to resident services, including more robust integration of resident services with property management. It is now more common for resident service coordinators to have access to data on rent arrears and lease violations, which allows them to conduct targeted outreach to residents at risk of housing instability and help connect them with needed supports. Affordable housing properties also have greater awareness of—and place greater emphasis on—the the interconnectedness of household-level outcomes (such as housing stability) and property-level goals.[43]

Overall, this study provides strong evidence that the resident services enhance property-level financial health but additional research is needed to better understand the mechanisms through which this favorable outcome is achieved. In addition, additional research is needed to better measure the dosage of resident services and to better understand how the evolution in resident services over the last few years may have changed the impact of these services on financial performance. Among the ways that future research could build on this study include:

---

[42] As a point of reference, $1000/unit is a common benchmark for replacement reserves (i.e., funds set aside to replace major building elements that wear out over time) is $1000 per unit. For example, see Section 4-11(B) Recommended Minimum Threshold of HUD Handbook 4350.1: Chapter 4 Reserve Fund for Replacement.

[43] See SAHF's Housing Stability Cohort: A Practitioner's Guide

- ***Further refinement of model***: Future research could include additional qualitative research to gain additional insights to shed light on ways to expand and/or refine the logic model. Among the types of information this qualitative research could explore are: 1) how property owners/operators and/or sponsors make decisions about whether to provide services, what types of services to provide, and how much to spend on services; and 2) whether there are specific factors that influence these decisions and how might we adjust our model accordingly. Future research could also broaden the range of intermediate outcomes (mediators) to include non-financial factors, such as satisfaction, community cohesion, or property reputation.
- ***Alternative modeling techniques***: Additional research could test these hypotheses using alternative modeling techniques, such as structural equation modeling (SEM).[44] Such techniques are less standard than OLS but could allow for the estimation of multiple direct and indirect pathways through which resident services may influence financial outcomes.
- ***Revised timeframe and expanded data collection***: Future research should use post-Covid data to reflect the current state and nature of resident services. In addition, if possible, collecting information on the resident service expenditures and staffing at both the property and the organization level could help improve the quality of the "dosage" measures.

[44] SEM is a statistical technique that combines factor analysis (to measure latent factors such as resident satisfaction and service quality) and regression analysis (to understand the relationship between factors) and can run multiple regressions simultaneously.

Appendix A. Partners and Participating Organizations

This appendix provides information on the organizations that were critical to this study..Exhibit B-1 provides a brief description of SAHF and our four other Study Partners. Exhibit B-2 presents the 19 organizations that participated in the study, the total number of properties from their portfolios that are included, and the numbers of those properties with and without resident services (as of 2019).

Exhibit B-1. Study Partners

Organization	Description
Stewards of Affordable Housing for the Future (SAHF)	SAHF is a national collaborative of thirteen exemplary multi-state nonprofit affordable housing providers who own and operate more than 160,000 affordable rental homes across the U.S. SAHF's mission is to advance the creation and preservation of healthy, sustainable affordable rental homes that foster opportunity and wellness for people of limited economic resources. SAHF launched and administers the CORES certification program which has certified nearly 100 organizations to date, recognizing organizations with demonstrated experience and capacity in providing robust, impactful resident services in affordable housing. Visit https://sahfnet.org/ and https://coresonline.org to learn more.
Housing Partnership Network (HPN)	HPN is a member-driven network of more than 100 of the nation's leading affordable housing and community development organizations. Together, HPN members leverage their collective innovation and expertise to advance solutions that create affordable, livable, and sustainable communities for all. Visit housingpartnership.net to learn more.
NeighborWorks America (NeighborWorks)	NeighborWorks is a congressionally chartered, national nonprofit that creates opportunities for people to live in affordable homes, improve their lives and strengthen their communities. For over 45 years, we've supported a network of nearly 250 local organizations in every state, Washington, D.C., and Puerto Rico with grants, training and technical assistance. Together, we deliver practical solutions that expand housing access, build wealth and boost local economies. Our impact is visible in families achieving homeownership, entrepreneurs launching businesses and communities growing stronger every day. This is how we create homes and build America. Visit https://www.neighborworks.org/ to learn more.
Multifamily Impact Council (MIC)	MIC is a non-profit membership organization dedicated to increasing the flow of impact capital into the affordable and sustainable multifamily housing sector by providing guidance, supporting research initiatives, and maintaining a common framework of industry standards for impact-driven multifamily investments. Launched in 2023, the MIC's **Multifamily Impact Framework™** established industry standards for impact investing specific to the multifamily sector and has been downloaded (at no cost) by more than 500 organizations who are using it to guide investment strategies, product development, and management practices. Visit https://multifamilyimpactcouncil.org/ to learn more.
National Leased Housing Association (NLHA)	NLHA has successfully represented owners and managers of federally assisted rental housing, including public housing authorities, nonprofit organizations, and private sector participants who collectively house millions of low-income American families. Our members are deeply committed to expanding and preserving the nation's affordable housing stock through effective public-private partnerships. Visit https://hudnlha.com/ to learn more.

Exhibit B-2. Number of properties with and without resident services in property selection sample by participating organization (2019)

Member Organization	Total number of included properties	Number of included properties without resident services	Number of included properties without resident services
Affordable Homes & Communities (AHC)	10	5	5
Beacon Communities	19	9	10
BRIDGE Housing	8	5	3
Community Housing Improvement Program (CHIP)	6	3	3
Chinatown CDC	8	1	7
Connected Communities/Winn Companies	18	6	12
DHIC	18	0	18
EAH Housing	16	5	11
HDC MidAtlantic	9	4	5
Improved Dwellings for Altoona	4	2	2
Jamboree Housing	4	2	2
Linc Housing	12	3	9
Moderate Income Management Company (MIMC)	6	3	3
Mercy Housing	7	3	4
National Church Residences	30	17	13
National CORE	31	1	30
Preservation of Affordable Housing (POAH)	20	14	6
Retirement Housing Foundation	18	7	11
The Community Builders	4	2	2
Total	**248**	**92**	**156**

Appendix B. Logic Model

The logic model (see Exhibit A-1) shows how the inputs specified at the left (service coordinators), lead to activities (service coordination and delivery) that produce both individual- and property-level outcomes, generating a range of positive impacts, including the property-level impacts that are the focus of this research.

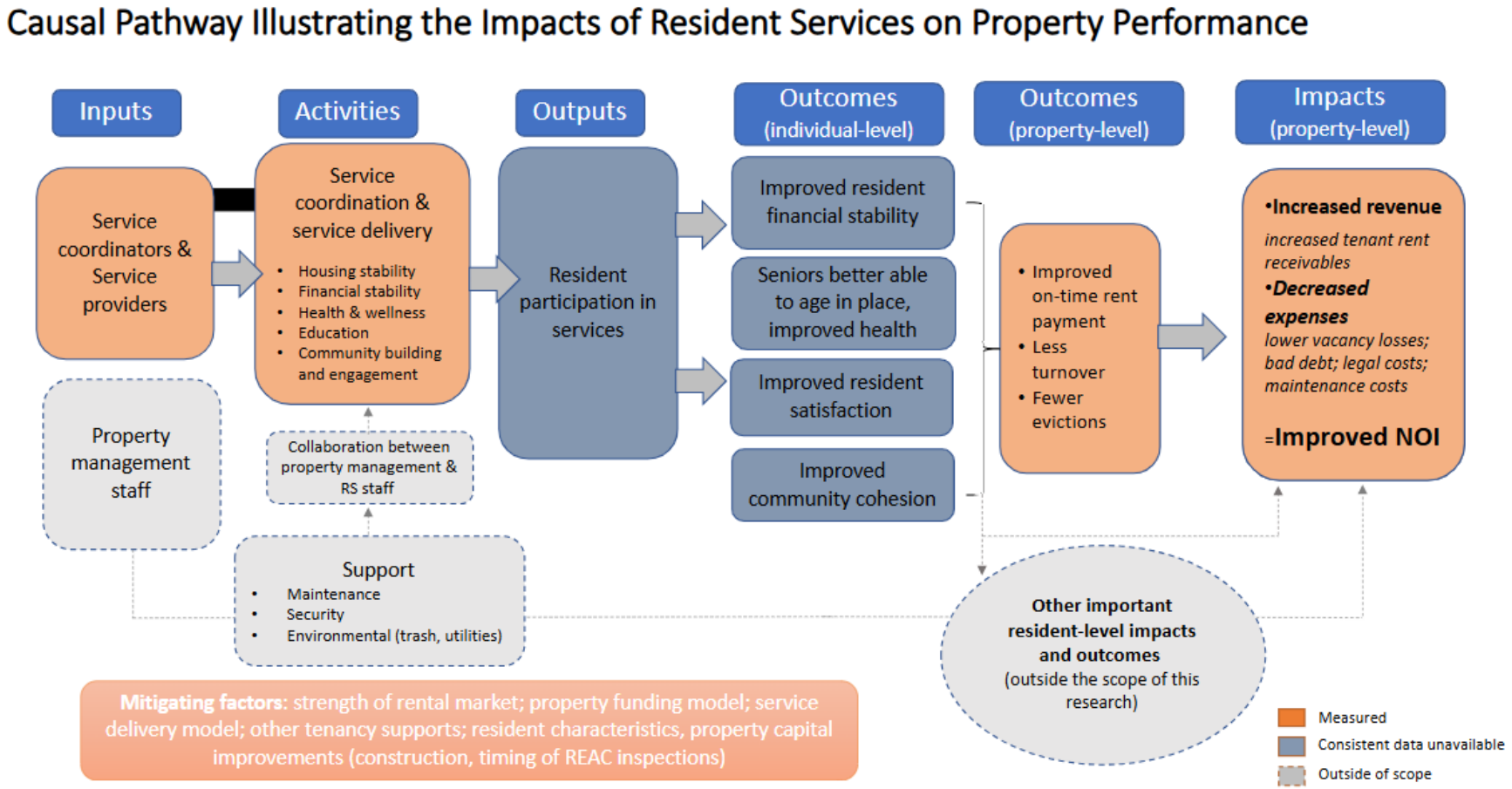
Inputs: *Inputs* include the resources that are devoted to providing resident services, including financial resources (e.g., for third-party service providers) and time (e.g., for onsite service staff who assess resident needs and coordinate service delivery).

Activities/Outputs: *Activities* include the outreach, community and resident assessments, and specific resident service programs, which can target a variety of resident needs (e.g., housing stability, financial stability, health and wellness, education, and community engagement). The amount of resident services staffing and service delivery partners depends on the amount and type of funding available to support resident services. Residents select to participate in those programs and services that are offered and that align with their financial, health, and/or wellness needs. *Outputs* are the direct products of activities, e.g., the number of residents who choose to participate in services.

Resident Outcomes/Impacts: As a result of taking up services, residents see individual benefits such as health improvements and greater financial stability. In addition, residents might feel stronger connections to the community and improved overall satisfaction with the property.

Property Outcomes/Impacts: Improvements in resident-level outcomes translate into improved property-level outcomes, e.g., improved financial health of the property. Residents with greater financial stability are more likely to pay rent on time, improving property cash flow and decreasing costs for collections. Older residents with improved health are more likely to "age in place", reducing turnover expenses. Residents who are better connected to their residential community and satisfied with their living situation will be less likely to move and more likely to maintain their unit, reducing both turnover and maintenance expenses. All of these improved property-level financial outcomes translate into higher net operating income (NOI).

Exhibit A-1: Final Resident Services-Property Performance Logic Model



Appendix C. Sampling and Data Collection

This appendix provides additional information about approach to sampling and data collection for this study.

C.1. Sampling Approach

- ***Stage 1: Development of Sampling Frame:*** In Stage 1, we compiled a list of affordable housing organizations. To support this effort, SAHF and the other four Study Partners provided their membership lists, which we combined with information about these organizations' portfolio footprints. From this list we removed organizations with fewer than 10 properties, those that had no affordable housing properties listed in the National Housing Preservation Database, and those with no internet presence. The final sampling frame included approximately 200 organizations, comprised of both nonprofit and for-profit entities.

- ***Stage 2: Sampling and Recruitment of Organizations:*** In Stage 2, we randomly selected 45 organizations from this list to approach to see if they would like to participate in the study. Many organizations were not able to participate in the study, for example, because they did not retain data from 2015 to 2019 or had limited staff capacity to assist in the study. As a result, we conducted three additional rounds of sampling and ultimately reached out to nearly all organizations in the sampling frame. In the end, 19 member organizations were able to participate in the study (see Appendix B for list of participating organizations).

- ***Stage 3: Sampling of Properties***: In Stage 3, we collected an initial set of data on all properties in each organization's portfolio. We screened out properties: 1) with 40 or fewer units[45]; 2) that categorized their property type as "Permanent Supportive Housing, other special needs population" [46] and/or identified 20 percent or more of their units as Permanent Supportive Housing;[47] 3) that had any large capital expenses during the analysis years; and/or 4) that had resident services managed by a third party. The resulting list included 1,556 eligible properties, 953 with and 603 without resident services. From this list we randomly selected properties with and without resident services from each recruited organization based on their size from the remaining properties.[48] This approach led to an initial property sample of 295 properties, 176 with and 119 without resident services. For selected properties, we collected additional information on the properties and the tenants within those properties. Some organizations were not able to provide data for all of their selected properties. [49] Our final sample included 248 properties, 156 with services and 92 without.

[45] We screened out properties with fewer than 40 units due to concern about the high sensitivity/fluctuating nature of their financial outcomes. We recognize that this decision leads to very few, if any, rural properties being included in our study.

[46] The other two options for occupancy type were "family" and "senior."

[47] Separate from listing PSH as a property type, member organizations provided information on the number of units in each property that were designated as PSH units.

[48] We asked each organization in the sample to provide data on a random selection of approximately 10 percent of their eligible properties with resident services and 10 percent of eligible properties without resident services. This count was adjusted to create an even number of properties with and without resident services and was limited in several cases by available data for service-enriched or non-service-enriched properties.

[49] For three organizations, we relaxed our sample restriction of properties with fewer than 40 units to retain enough properties to keep those organizations in our analyses. In a few instances, pilot data previously collected was used to supplement gaps in data.

Details of the sampling strategy are summarized in Exhibit C-1.

Exhibit C-1 Sampling Method Details

Sampling Details		
	Organizations	**Properties**
Sampling Strategy	Multi-stage stratified cluster probability proportional to size sample	
Sampling Universe	Affordable housing organizations that are members of key affordable housing networks supporting improved resident outcomes	All properties (meeting the criteria) managed by these organizations
Sampling Frame	Members of affordable housing networks with: 1) at least 10 properties; 2) at least one affordable housing property listed in the National Housing Preservation Database; and 2) an internet presence.	Organization property portfolio list
Sampling Criteria	3 rounds of random selection	• Over 40 units • No more than 20% Permanent Supportive Housing (PSH) • No large capital expenses during data collection period • Direct management of resident services
Sampling Technique	Stratified (stratified on presence/absence of services) cluster (organizations) probability proportional to size sampling based on organizational size (number of properties managed).	
Target Sample Size	25 organizations	250 properties: 125 service-enriched, 125 non service-enriched
Actual Sample Size	19 organizations	248 properties; 156 service-enriched, 92 non service-enriched

C.2. Data Collection

Organizations provided data in a Microsoft Excel template by extracting property and tenant information from their varying systems and copying them into the data collection template. They then used a secure file transfer method to share their data with the study team. Exhibit C-2 depicts the data collection process.

Exhibit C-2 Data Collection Process

Data Elements Collected

We used the property and tenant data collected directly from organizations as well as external datasets to conduct our analyses. We matched external public data sets to organizations' property data based on property address or federal subsidy ID. For example, we matched census data representing information on rental market characteristics and neighborhood poverty to the property data based on census tracts. We also matched supplemental data on federal housing subsidies and tenant characteristics to the property data from the National Housing Preservation Database (NHPD).

Exhibit C-3 contains a list of the data elements that we collected and their sources.

Exhibit C-3 Data Elements Collected for Member Organizations and Sample Properties

Type of Information	Data Elements Collected	Data Source
All Affordable Member Organizations		
Portfolio information	States of operation	Industry Associations/NHPD
	Locations of federally assisted properties	NHPD
	Approximate count of total properties, units owned or managed	Industry Associations/NHPD
	Main occupancy type	Industry Associations/NHPD
Resident Services	Organization offers resident services	Study Partner Member Lists

Type of Information	Data Elements Collected	Data Source
Affordable Multifamily	Organization has properties participating in federal subsidy/tax credit programs	NHPD
Portfolio of Sample Organization's Properties (2015-2019)		
General Property Information	Property Address Number of Units	Member Organization Member Organization
Resident Services	Has RS Frontline provisions RS Third party management of RS	Member Organization Member Organization Member Organization
Property Type	Family Senior PSH, other special needs population	Member Organization Member Organization Member Organization
Federal Subsidy Information	Presence of federal subsidy (ex. LIHTC, PBRA, PBVs)	Member Organization/NHPD
Other Eligibility Criteria	Large capital expenses Number of Permanent Supportive Housing Units	Member Organization Member Organization
Sample Properties Only (2015-2019)		
General Property Information	Address	Member Organization
Property Expenses	N/A	Member Organization
Property Revenues	N/A	Member Organization
Resident Service Provision	Resident Services Expenses, Resident Services FTEs	Member Organization
Tenant Economic and Demographic Information	Household income, disability status, race/ethnicity, and gender	Member Organization
Neighborhood Characteristics	Census tract poverty rate	American Community Survey 2021/Tract derived from address
Rental Market Characteristics	Census tract median gross rent	American Community Survey 2021/Tract derived from address
Regional prices	State-level regional price parity index	Bureau of Economic Analysis (Regional price parity index)

Appendix D. Descriptive Statistics, Key Variables

Exhibit D-1 provides descriptive statistics including the means, standard deviations, and minimum and maximum values for key variables in our analytic dataset for our sample properties.

Exhibit D-1. Descriptive Statistics- Key Variables (2019)

Type of Information	Key Variables	N	Mean	Standard Deviation	Min	Max
Resident Services						
"Treatment" Variables	Resident services dummy variable	248	0.63	0.48	0.00	1.00
	Amount spent on resident services per unit ($100 units)	196	2.13	2.97	0.00	17.83
	Staff dedicated to resident services per 100 residents (FTE)	223	0.28	0.39	0.00	2.16
Financial Performance	***Per unit***					
Domain 1	Net Operating Income (NOI)	222	$4,550	$5,653	$(29,821)	$25,746
	Controllable NOI	181	$5,277	$4,228	$(5,716)	$25,016
	CNOI minus external RS revenue and expenses	164	$4,955	$4,116	$(6,011)	$24,357
Domain 2	Total Revenue	200	$12,798	$6,467	$0	$40,334
	Total Revenue—external RS funding	182	$11,743	$6,186	$(1,385)	$38,450
	Total Contract Rent Revenue	195	$12,215	$6,358	$(665)	$38,450
Domain 3	Total Non-RS Expenditures	191	$7,949	$3,414	$1,344	$22,539
Domain 4	Rent Receivables	173	$66	$111	$0	$618
	Total Arrears	98	$101	$288	$0	$2,069
	Bad Debt	196	$52	$81	$0	$700
	Vacancy Loss	198	$339	$407	$0	$2,428
Domain 5	Legal	185	$63	$192	$0	$2,430
	Maintenance	203	$1,708	$1,026	$72	$6,096
	Security costs	182	$187	$369	$0	$1,883
Domain 6	Turnover Rate	98	5.7	9.9	0	48.2
Domain 7	Percent Tenant Portion of Rent Collected	63	52.3	28.0	12.3	100.0
	Percent of Contract Rent Collected	63	99.6	0.7	96.7	100.0
Other key variables						

Type of Information	Key Variables	N	Mean	Standard Deviation	Min	Max
Property characteristics	LIHTC	248	0.57	0.50	0	1
	Project-based Section 8	248	0.34	0.48	0	1
	State/local subsidies	248	0.19	0.39	0	1
	PRAC	248	0.04	0.21	0	1
	PBV	248	0.07	0.25	0	1
	PSH	248	0.02	0.15	0	1
	Building age	246	30.5	20.2	0	118
	Target population: Family/Other	217	0.59	0.49	0	1
	Number of units	232	108	90	4	768
Census Tract characteristics	Poverty rate	248	20	11	2	58
	Median rent	248	1165	454	361	2750

Appendix E. Number of Properties and Property-Year Observations by Model

Exhibit E-1 provides the unique number of properties and total property-year observations included in each regression for each of the three sets of analyses.

Regression (Dependent Variable)	Resident Services Treatment/Independent Variable:					
	Set 1		Set 2		Set 3	
	Has resident services (binary variable)		Dollars/unit spend on resident services		Number of FTE staff dedicated to resident services	
	Unique	Total	Unique	Total	Unique	Total
Regression 1 (NOI)	167	485	188	676	212	763
Regression 2 (CNOI)	134	365	152	544	171	609
Regression 3 (CNOI- RS expenses)	104	243	151	539	160	558
Regression 4 (Total Revenue)	149	419	171	609	190	674
Regression 5 (Total revenue-RS funding)	124	311	170	604	180	629
Regression 6 (Total non-RS expenditures)	149	418	171	605	186	665
Regression 7 (Total contract rent revenue)	145	407	166	600	182	651
Regression 8 (Rent receivables)	123	349	142	516	160	587
Regression 9 (Total arrears)	90	312	77	297	89	352
Regression 10 (Bad debt)	146	432	165	600	184	677
Regression 11 (Vacancy loss)	149	435	167	605	186	682
Regression 12 (Legal expenses)	139	396	157	544	176	625
Regression 13 (Maintenance expenses)	157	447	170	605	194	691
Regression 14 (Security expenses)	134	371	153	542	172	622
Regression 15 (Turnover rate)	90	312	77	297	89	352
Regression 16 (Percent tenant portion of rent collected)	63	214	49	186	54	208
Regression 17 (Percent of contract rent collected)	63	214	49	186	54	208

Appendix F. Results From Primary Model

		Coefficient on NOI
Independent Variable		
Treatment Variable	RS dummy	0.26** (0.001)
Covariates		
Year (ref=2016)	2017	0.01 (0.898)
	2018	0.01 (0.916)
	2019	-0.01 (0.933)
Property Type (ref = family/unrestricted)	Senior	0.04 (0.685)
Subsidy Dummies	Any Project Based Section 8	0.48** (0.000)
	Any PBV	0.14 (0.337)
	Any PRAC	-0.07 (0.744)
	Any LIHTC	-0.18+ (0.077)
	Any state/local funding	0.15 (0.320)
Other	Number of Units	-0.00 (0.969)
	Permanent Supportive Housing (any)	0.33 (0.349)
	Census: Median Gross Rent	0.00** (0.000)
	Census: Poverty Rate	0.00 (0.936)
	Building Age	0.00 (0.153)
	Constant	-1.15** (0.000)
	N	485
	R^2	0.187
	Unique properties	167

Significance: ** = 99% confidence level; * 95% confidence level; + 90% confidence level
Note: P-values in parenthesis. Coefficients for missing flags and member organization fixed effect coefficients not shown.