Technical Appendix to The Cost of Affordable Housing: Does It Pencil Out?

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The National Housing Conference (NHC) and the Urban Institute partnered to explain through data visualization why in many places and at many times the market cannot build affordable multifamily housing without subsidies. The financial model underlying the visualization is based on illustrative examples NHC created using a small sample of project data with actual costs and financing. We looked at the costs to build and finance affordable multifamily housing developments, costs to operate those developments, income that the developments could expect, and the gap between the achievable capital and development costs that challenges many affordable housing developers.

Understanding Our Model

Data Sources

NHC created illustrative scenarios based on a small sample of properties from Denver, Colorado. The Denver metropolitan (metro) area is experiencing growth in rental housing demand, but it is not a traditionally high-cost city. Based on NHC's 2016 Housing Landscape report and examining the housing affordability for working households in 50 metro areas, Denver is the 15th most affordable (Ault 2016). Though market conditions vary widely nationwide, overall Denver is representative of other US cities in terms of rising rents and low vacancies.

NHC reviewed data on properties that received funding from the City of Denver's Revolving Affordable Housing Loan Fund in 2015; this gap funding, along with Low Income Housing Tax Credits and other sources, allowed these properties to move forward.[1] These property applications contained full underwriting information including total development costs, expected operating expenses, other property income, property reserves, estimated vacancy rates, and expected rents. From these data,

NHC created example properties of 50 and 100 apartments and modeled those examples serving different income levels: market-rate residents, residents earning 60 percent of area median income (AMI), and residents earning 30 percent of AMI. The examples are illustrative composites and do not represent a particular property.

NHC's model simplified calculations by representing all the apartments of a particular size in each example at the same rent level rather than trying to model minor variations in rent based on unit size, renewal date, or other factors. This approach is common in preliminary underwriting. For this exercise, modeling uniform rents helps make the analysis easier to understand.

NHC used several other data sources (listed in the references) to benchmark variables in the model and provide ranges for sensitivity analysis.

Model Components

Each example development has four components: property income, costs to operate the property, debt sizing, and sources/uses. Property income and operating costs determine how much net operating income (NOI) is available to pay the property's mortgage debt, and therefore the maximum size of the mortgage debt. Mortgage debt plus a mix of other financing sources fund the end uses of creating the property. If the property cannot support enough mortgage debt to cover its building costs, other sources must be found or the property cannot be built.

In sketch, the model calculates the following:

+	Property income from rents
-	Expenses to operate the property
-	Vacancy losses
=	Net operating income, or NOI
+	Maximum mortgage debt (calculated from NOI)
+	Tax credit equity
+	Other sources
=	Total sources of funds
-	Acquisition cost
-	Design and construction costs
-	Financing fees
-	Reserves
-	Developer fee
=	Total development costs, or uses

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A property is built only if the sources of funds meet or exceed the total uses of funds.

To do this financial analysis, NHC had to make assumptions about the example properties and how they would be financed and operated. We held these assumptions constant across the various scenarios to better demonstrate the impact of other factors. These assumptions include vacancy rate, capitalization rate, interest rate, replacement reserves, debt service coverage ratio, loan-to-value ratio, and developer equity. The assumptions are described below.

PROPERTY INCOME

To calculate property income, NHC used total rental income based on rents appropriate to the income of the tenants served. For market rents, we used median market rents for the Denver metro area from the fourth quarter of 2015 (Throupe and Von Stroh 2016). At that time the average rent for a one-bedroom apartment in the Denver metro area was $1,198. Rent levels affordable to tenants at 60 percent of AMI and 30 percent of AMI were based on 2016 tax credit rents as set by the Colorado Housing Finance Agency.[2] The rent level affordable to a household earning 60 percent of AMI living in a one-bedroom apartment in Denver is $901. For a household earning 30 percent of AMI, rent for a one-bedroom apartment in Denver is affordable at $450. NHC's model also considered a mix of one-, two-, and three-bedroom apartments with differing rents based on those sizes. Some multifamily properties can have other income, such as from on-site laundry facilities or commercial space for rent. Not every project in our sample had other income and for the properties that did receive other income, the amount was negligible. Because other income was not significant for our sample of properties nor is it typically a determining factor in whether a project is viable financially, our model does not include it.

OPERATING COSTS

To determine annual costs to operate each project, we modeled four categories of operating costs: administrative, operating, maintenance and replacement reserves. Table 1 shows the elements of those costs. Replacement reserves were based on $300 per unit per year, a reasonable level for new construction properties to ensure adequate funding for a property's long-term capital needs. The other elements were based on our dataset of Denver properties.

TABLE 1

Operating Costs

Expense category	Components
Administrative	Staff salaries, health insurance and other benefits, advertising and office supplies
Operating	Owner paid utilities, fire and liability insurance and trash removal
Maintenance	Property maintenance and repair costs, separate from major capital improvements
Replacement reserves	Payments made in escrow to cover the costs of capital needs and major systems repairs and replacements that occur as the property ages. For example, replacing appliances, air conditioners, water heaters, and roofs.

Note: Categories defined by the city of Denver's Office of Economic Development, Housing & Neighborhoods's underwriting guidelines.

How to Fund Multifamily Development

To finance a multifamily property, the developer must have sufficient funding sources (mostly a combination of debt and equity) to pay for all the necessary uses (acquisition, construction, developer profit and other costs). The difference between total sources and total uses is the financing gap; if the gap is more than zero, the property is not feasible. The models we created illustrate the different factors that affect the financing gap.

Debt Sizing

A property's NOI is a key factor in determining a project's supportable debt. Net operating income is based on the income the property receives from rents paid by tenants less operating expenses and vacancy loss. Our model reduces rental income by an economic vacancy factor, modeled at 7 percent, which is typical for long-term underwriting and in line with the underwriting of Denver properties we reviewed. Additionally, both local and national data support this figure: in 2015 the national rental vacancy rate was 7.6 percent (JCHS 2015), while vacancy rates in the metro Denver area from 2005 to 2015 varied significantly from 3.5 to 8.6 percent (Throupe and Von Stroh 2015). Based on these data sources, we chose 7 percent as a realistic underwriting assumption. After adjusting for economic vacancy, we deduct total operating expenses to calculate NOI.

To determine the level of mortgage debt the property could support, NHC used simplified versions of a lender's debt-sizing tests of income and asset value. A lender would generally base the amount it would be willing to finance on the lesser of the results of these two tests. On the income side, NHC

calculated a project's NOI and used the debt service coverage ratio to size the possible debt each example project could support. Dividing a property's net operating income by the debt service coverage ratio generates the amount of mortgage debt the property can support. The debt service coverage ratio for the model was set at 1.15, the midpoint of the range from 1.0 to 1.3 required among multifamily lending programs. A low ratio of 1.0 means a project will have just enough cash flow to pay its debt with little, if any, cash flow available for unexpected events. A high ratio of 1.3 means a project will have significant cash flow left over after paying its debt service.[3] Typically lenders for market-rate developments will require a higher debt service coverage ratio; lenders working with affordable developments will require a lower debt service coverage ratio. NHC used a mortgage interest rate of 5 percent based on current rates for multifamily commercial loans (Greystone 2016; PNC 2015).

For the asset value test, NHC used the capitalization rate and loan-to-value (LTV) ratio to determine the maximum loan a lender would make based on the property's value. Capitalization rates used in the model were based on a review of commercial and multifamily lending forecasting. These sources showed a range of predicted and reported capitalization rates for the sector (Freddie Mac 2016; Integra Realty Resources 2016). We chose a median figure of 5.75 percent. NHC used an LTV ratio of 87 percent based on requirements for affordable developments using Federal Housing Administration (FHA) 221(d)(4) loans. Other multifamily lending sources—such as banks, Fannie Mae, Freddie Mac, and conduit lenders—often use a lower LTV ratio, which would produce a lower maximum loan amount and therefore lead to a larger gap.

Sources and Uses

NHC considered typical funding sources in addition to mortgage debt, including equity from Low Income Housing Tax Credits (LIHTC) for larger affordable properties, deferred developer fees for affordable properties and developer equity for market-rate properties. The difference between the sum of these sources and the total development cost or uses is the gap that has to be filled for properties to move forward. In some instances, the gap cannot be filled and the project is not built. Simply put, sources have to equal uses. For market-rate properties, investors and lenders have to see a return either through payments of interest or payment from the future sale or refinance of the property, and they can provide mezzanine debt to fill the gap. For affordable properties, mezzanine debt and developer equity are rarely, if ever, available. So developers apply for tax credits, defer some of their developer fee, and look for soft loans and grant funds to fill the gap.

Low Income Housing Tax Credits are a federal subsidy; investors receive tax credits in exchange for providing up-front equity capital to finance affordable housing. Tax credits are available through a competitive application process administered by state housing finance agencies; in almost every state, far more properties apply for tax credits than the state can fund. Additionally, tax credits work much more efficiently for larger properties, which is why this model does not use tax credits for the examples with 50 apartments. For soft loans and grants, the federal Community Development Block Grant and HOME programs are two sources that can help fill the gap, but soft financing sources are oversubscribed and insufficiently funded to meet the gap financing needs of all affordable properties. For example, the city of Denver received $2.2 million in HOME funds in fiscal year 2015; even if the city chose to use all those funds for our example 30 percent AMI project, it still would not fill the gap for that property.

To understand the costs to construct a multifamily development, referred to as the uses, NHC looked at acquisition costs, construction costs, design fees, interim costs, permanent financing fees, operating and debt service reserves, developer fees and project management fees. Developer fees in these examples are around 11 to 12 percent of total development costs, which is within industry norms of 10 to 15 percent. The examples are based on per-unit averages for comparably sized properties in the sample.

Testing the Model

NHC analyzed the impact of changing the various model assumptions on the 100-apartment, 60 percent AMI project to test the robustness of our model. The key takeaway from the testing is that no single variable has extreme impacts on the model. The gap remains regardless of how each variable changes. All the parameters can be adjusted in the visualization tool so users can do their own testing of the model and understand the implications of changing different parameters of the property, the rents, and the economic conditions.

Results

This analysis shows that most multifamily properties, even market-rate apartments, face a gap between how much it will cost to construct the project and the private, public, and other funds available to pay

for the development. Four key factors drive this gap: rent levels, property size, subsidy availability, and development costs.

- Higher rents make financing challenges easier but also mean there is less affordable housing in the market overall.

- Larger properties can make financing challenges somewhat easier since they generate more rental income than smaller properties, but large properties are often not appropriate for multifamily housing in rural and smaller communities.

- Capital and operating subsidies can help address the gap facing affordable multifamily properties.

- Development costs, primarily construction and acquisition, vary much more by place than by property and can be greatly affected by state and local policy.

Glossary

Acquisition costs: Cost to purchase the land and any existing buildings on that land.

Capitalization rate: Measures the rate of return on total capital invested (i.e., the estimated rate of return on a property at the time of purchase or initial stabilized year). Dividing projected annual income by the capitalization rate produces a present-day asset value.

Construction costs: Costs to build the property, including building permit fees, materials, labor, site preparation, infrastructure, and landscaping.

Debt service coverage ratio (DSCR): A calculation to ensure the property has enough income to cover its debt obligation based on the relationship between the net operating income (NOI) of a property to the amount of debt service the NOI must be used to pay.

Design fees: Interior design, architect and engineering fees.

Developer fees: Cost to pay the developer for staff time and labor to complete the property, including profit for the risk taken and resources expended.

Deferred developer fee: The portion of the agreed-upon developer fee that the developer is not paid as a development expense and instead remains as a loan in the rental property. The deferred developer fee may be recovered from the developer's share of operating cash flow. Once the property is complete, the developer will receive a fraction of the cash flow over time. So, after the property pays its obligations, from the remaining funds, a portion would go to the developer.

Equity: Investing private capital to acquire or develop a multifamily property in exchange for a range of financial returns on that investment (Williams 2015). Tax credit equity is when investors provide up front capital for an affordable multifamily development in exchange for federal tax credits, paid out over 10 or 15 years. Developer equity is when a developer fronts its own capital for a return usually from the property's cash flow (remaining funds after paying monthly debt obligations, operating costs, and other financing priorities).

Interim fees: Costs that occur during construction related to interest and fees on the construction loan, insurance during construction and other holding costs.

LIHTC: See Low Income Housing Tax Credit.

LIHTC rent limits: The maximum rent that can be charged to tenants in an LIHTC-assisted unit. It is limited to 30 percent of the applicable income limit less utilities.

Loan-to-value ratio: The loan amount divided by the property's value based on the capitalization rate and NOI.

Low Income Housing Tax Credit (LIHTC): A federal program to subsidize creation and preservation of affordable rental housing.

Mezzanine debt: Additional debt common in market-rate development repaid by property cash flow after the first mortgage debt service is paid. Mezzanine debt typically has a higher interest rate and shorter repayment period than the first mortgage and usually comes from nonbank lenders with more flexibility and higher risk tolerance than banks.

Mortgage debt: Borrowing funds from a financial institution to finance a multifamily housing development. The borrower must repay the loan by a certain date, typically 30 years in the future. The borrower must also pay interest on the loan to compensate the lender. Mortgage debt typically amortizes over time, so the regular payments include both interest and principal.

Net operating income (NOI): Rental income remaining after payment of operating costs and vacancy losses. The net operating income is based on the monthly rent expected for each apartment size (one-, two- or three-bedroom) multiplied by the total number of units multiplied by 12 for the 12 months of the year the property receives rental income.

Operating and debt service reserves: Funds set aside on a regular schedule for future risks or expenses. For example, the replacement reserve covers replacement of major capital items that occur infrequently. The operating reserve would cover the property's operating expenses if necessary because of a lower than estimated operating income one month.

Permanent financing fees: Fees and expenses related to the mortgage loan and when applicable, fees related to the Low Income Housing Tax Credit.

Soft loans: Funding usually from state or local governments that has a below market interest rate to help close the gap for affordable housing.

Total development cost: All the expenses necessary to develop a multifamily property. This would be acquisition costs, construction costs, design fees, interim costs, permanent financing fees, operating and debt service reserves, developer fees, and project management fees.

Vacancy rate: Estimate of the lost revenue defines the loss to a property from units that are vacant from a tenant ending a lease or not rentable because of repairs or renovations. In underwriting terms, physical vacancy refers to a percentage of units not available, which economic vacancy refers to revenue lost due to vacancy. For simplicity, this model uses economic vacancy.

Notes

1. NHC thanks the City of Denver's Office of Economic Development Housing Division, especially Rick Padilla and Laura Brudzynski, for its assistance with this project and the data it provided.

2. Liz Smith (manager, multifamily program compliance, Colorado Housing and Finance Authority), "2016 Income Limits and Maximum Rents," letter to multifamily housing owners and managers, April 7, 2016.

3. NHC used FHA requirements for its 221(d)(4) program as well as historical data for LIHTC properties from Cohn Reznick (2015) and Greystone (2016).

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About the Authors

Ethan Handelman directs NHC's policy and advocacy agenda focused on advancing federal housing policy to assist low- and moderate-income people; strengthening the nation's housing finance system; connecting people to opportunity through housing; advocating for housing policy during tax and budgetary reforms; and building stronger communities that coordinate, housing, transportation, health, education, technology and energy policy. He has testified before Congress and speaks and writes regularly on housing issues. Ethan joined NHC in March 2011 after leading the advisory practice at Recap Real Estate Advisors, assisting public- and private-sector clients to understand and shape the affordable housing financial and policy environment. Ethan received his MA in international relations from Harvard University and holds a BA in political science from the University of Michigan. He serves on the board of Housing Unlimited, a nonprofit housing provider in Montgomery County, Maryland.

Rebekah King joined NHC as a policy associate in August 2014. Rebekah works with coalitions and communicates with administration officials and congressional staff on affordable housing policy issues. She writes and produces NHC policy materials including regulatory comments, coalition statements, blog posts, publications and the Washington Wire, NHC's weekly update to its members. Rebekah leads NHC's Green Affordable Housing Coalition and supports many of NHC's working groups; she also represents NHC in a number of coalitions like the Campaign for Housing and Community Development Funding and the Equity Caucus. Before joining NHC, Rebekah worked with Howard County, Maryland's HOME program, primarily on CHDO and compliance issues. She also worked as a research associate at Energy Programs Consortium, drafting briefs and policy materials on residential energy efficiency finance. Rebekah started her career as a policy and program analyst with the North Carolina Housing Finance Agency, supporting the agency's foreclosure prevention programs, annual reporting, policy initiatives, and program oversight. Rebekah believes in affordable housing as a platform for families to improve their lives and the important role of federal policy in supporting affordable housing. She received her master's degree in city and regional planning from the University of North Carolina at Chapel Hill in May 2008 and her bachelor's degree from James Madison University in May 2006.