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On Commercial Construction Activity's Long and Variable Lags *

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Abstract

We use microdata on the phases of commercial construction projects to document three facts regarding time-to-plan lags: (1) plan times are long—about 1.5 years on average—and highly variable, (2) roughly one-third of projects are abandoned in planning, (3) property price appreciation reduces the likelihood of abandonment. We construct a model with endogenous planning starts and abandonment that matches these facts. Endogenous abandonment makes short-term building supply more elastic, as price shocks immediately affect the exercise of construction options rather than just planning starts. The model has the testable implication that supply is more elastic when there are more "shovel ready" projects available to advance to construction. We use local projections to validate that this prediction holds in the cross-section for U.S. cities.

Keywords: commercial real estate, construction, time to plan

JEL Classification: R33, E22, E32, L74

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1. INTRODUCTION

Commercial construction accounts for a sizable portion of private domestic investment (about 20%) and is an important driver of investment fluctuations.[1] Commercial construction investment is also well known to respond slowly to economic shocks (Edge, 2007), due in part to its long planning horizons (Millar et al., 2016). Indeed, Figure 1 plots year-over-year changes in commercial and total gross private domestic fixed investment and shows that commercial construction is both more volatile and slower to respond to business cycle fluctuations. If economic conditions deteriorate over the course of these long planning horizons, developers may abandon projects before starting construction. Existing work on such effects is limited, due in part to difficulties measuring construction activity that does not occur.

In this paper, we use unique microdata on the phases of construction for more than 200,000 U.S. commercial construction projects to discipline a tractable time-to-plan model of building production with endogenous abandonment. Our data includes both completed and abandoned projects, and it includes a panel of the phase history for each project, allowing us to observe the extent of and time variation in abandonment from planning. We develop the model to match three facts from the microdata. First, commercial construction projects have long planning horizons. The average time spent in planning for projects that make it to construction is about 1.5 years, roughly similar to average construction times. Second, a significant number of projects in planning (around 40 percent on a value-weighted basis) are abandoned before beginning construction. Almost all abandonments happen during the planning stage: of the projects that make it to the construction phase, over 99 percent are completed. Third, whether projects advance from planning to construction is state dependent. Specifically, higher commercial property price growth at the onset of a project increases the probability of the project being completed.

In the model, developers optimally choose how much to invest in planning starts and whether projects that complete planning proceed to construction. Projects in planning

[1]The source is the Bureau of Economic Analysis. The numerator is the sum of nonresidential and multifamily structures investment (FRED series B009RC1Q027SBEA and C292RC1Q027SBEA), while the denominator is FRED series GPDI. Note that nonresidential structures includes other structure types than those in the microdata in this paper, such as manufacturing and power.

are options to engage in construction that developers choose to exercise based on prevailing property values and building costs at the conclusion of planning. The model matches the facts from the microdata and also has an important implication for the supply of commercial buildings: the near-term response of construction activity to price appreciation depends on the availability of projects in planning. Price appreciation can affect construction activity by both stimulating planning starts and by causing more projects in planning to advance to construction. Because planning starts are slow to translate into construction activity, this second channel is the main driver of short-term supply elasticities and is dependent on the availability of "shovel ready" projects that can immediately begin construction.

We test this model implication by empirically examining cross-sectional differences in the response of construction activity to price appreciation. Specifically, we use local projections to trace out the response of construction starts to commercial price appreciation for metropolitan statistical areas (MSAs) with different initial stocks of projects in planning.[2] We demonstrate that construction starts are increasing in price growth, and this response depends importantly on the stock of projects in planning, as predicted by the model. As further validation, we find similar results for employment growth for the sectors most engaged in commercial construction activity.

In the final part of the paper, we calibrate and solve a standard DSGE model extended to include the commercial planning and construction environment from our earlier setup. Relative to the partial equilibrium model, the DSGE model allows us to endogenize commercial prices and to quantitatively examine the model's dynamics. We show that endogenous abandonment speeds up the response of construction activity to shocks (compared to an equivalent model with exogenous abandonment). This highlights how, even though plan times are long, investment may still respond quickly to shocks if there are projects already underway that are on the margin of advancing to construction. Additionally, we demonstrate the state-dependent nature of how construction activity responds to shocks. If an economy has a low stock of projects in planning, it is less

[2]We construct the measures of price appreciation and construction starts relative to the building stock by property type and MSAs using a combination of data from Costar, Real Capital Analytics (RCA), and CBRE Supplytrack.

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