

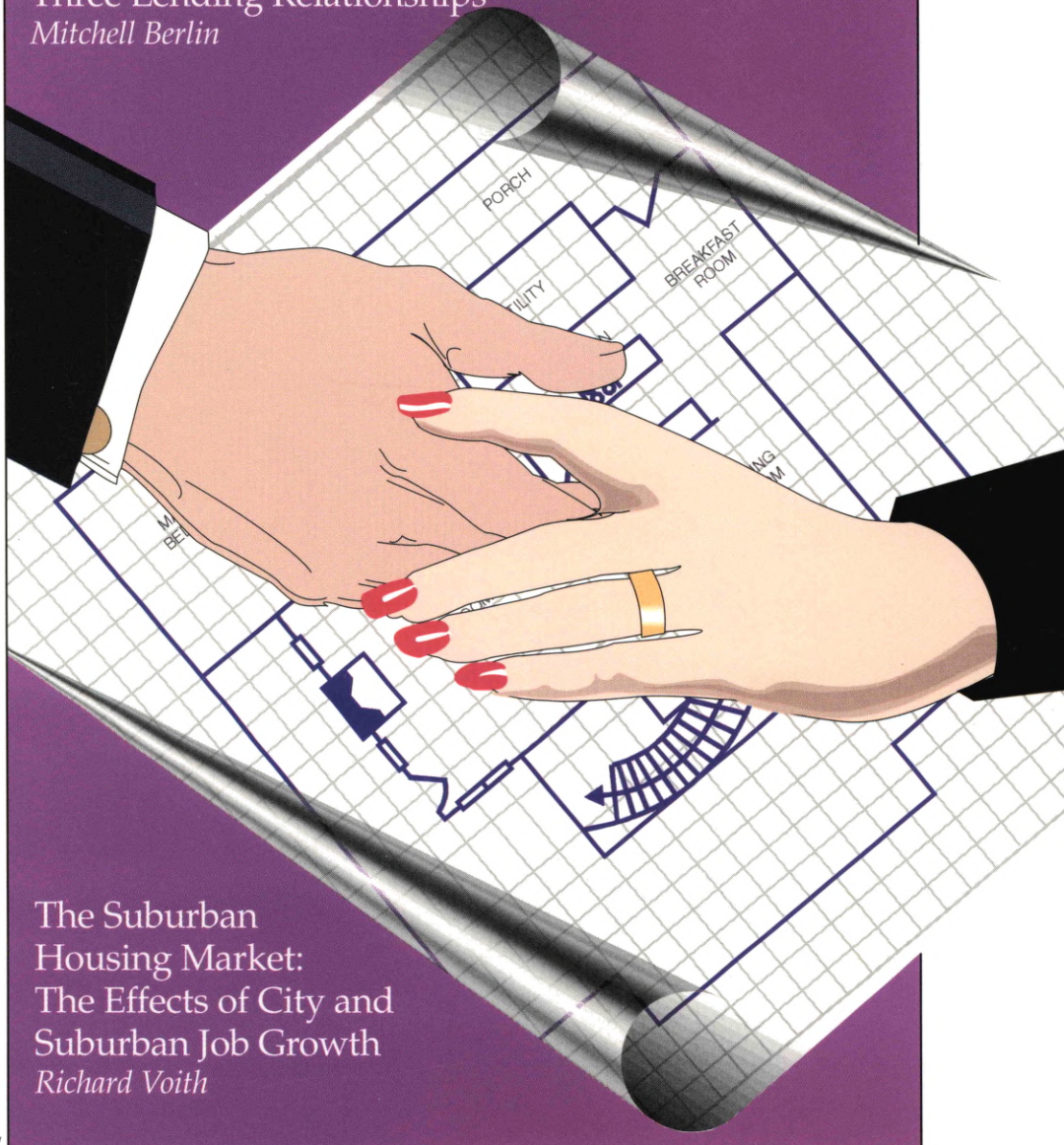
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Three Lending Relationships
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FOR BETTER AND FOR WORSE: THREE LENDING RELATIONSHIPS

Mitchell Berlin

Are close, long-term relationships between borrowers and lenders feasible in an increasingly competitive financial marketplace? How do relationships that have developed between banks and firms change when firms gain access to alternative funding sources, especially public securities markets? Can firms gain the best of both worlds by a judicious mixture of bank and public borrowing? Using three firms as examples, Mitchell Berlin sizes up the pros and cons of relationship lending.

THE SUBURBAN HOUSING MARKET: THE EFFECTS OF CITY AND SUBURBAN JOB GROWTH

Richard Voith

How does the location of new jobs in a metropolitan area affect the suburban housing market? Does it matter whether job growth occurs in the city or in the suburbs? And who, if anyone, benefits from job growth? Dick Voith takes a look at housing prices and construction rates in some Philadelphia suburbs to determine the impact of employment growth on the value of real estate assets.

For Better and For Worse: Three Lending Relationships

*Mitchell Berlin**

When bankers speak of building a relationship with a business customer these days, they usually mean selling the customer a whole range of financial products such as lock-boxes, letters of credit, and swaps, in addition to loans. When financial economists speak of *relationship lending* between banks and firms, they usually have a different, more old-fashioned idea in mind. They mean a close relationship between a firm and its banker, in which a single banker has intimate knowledge about the firm's affairs, built up over years of lending. Economists distinguish this type of lending from the more

anonymous *arm's-length lending*, in which institutions and individuals provide funds to firms by purchasing their public securities (stocks and bonds).

Over the last 10 years, financial economists have accumulated a significant body of empirical knowledge about the advantages and disadvantages of relationship lending. Their empirical studies have provided insights into some basic questions: Are close, long-term relationships between borrowers and lenders feasible in an increasingly competitive financial marketplace? How do relationships that have developed between banks and firms change when firms gain access to alternative funding sources, especially public securities markets? Can firms

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gain the best of both worlds by a judicious mixture of bank and public borrowing?

For firms making financial decisions or banks gauging their markets, these are clearly important questions. These questions are also important ones for policymakers. In developing countries and formerly communist countries—where financial systems are being created from scratch—these are precisely the types of questions that policymakers must confront when they weigh the relative merits of a bank-oriented financial system, like that of Japan, and a securities-oriented financial system, like that of the United States. Even in the sophisticated and highly competitive financial markets of countries like the United States, public policy affects the types of banking relationships that firms and banks form. For example, recent legislative proposals to provide subsidies to promote a secondary market for small business loans—much like the secondary market for mortgages—may increase smaller firms' access to securities markets and loosen their relationships with banks. Understanding the economics of lending relationships between banks and firms can illuminate such policy debates.¹

EXCLUSIVE RELATIONSHIPS CAN EASE CREDIT FOR SMALL FIRMS

Long-Term Exclusive Relationships Are Beneficial... Midget Widget is a small Midwestern firm with sales of \$10 million and a simple financial structure.² Midget has only two sources of external funds. Many of the firm's input suppliers offer trade credit; for example,

Midget's supplier of elbow sockets accepts payment 30 days after delivery. Midget also borrows on a continuing basis from Little Bank on the Prairie. Although Midget was started with a prayer and a loan from the owner's brother-in-law nearly 14 years ago, the firm has been taking out—and repaying—business loans from Little Bank for 10 years.

Over this 10-year period, Midget's borrowing terms have gotten better and better. At the outset, Midget was still struggling to establish its niche in the widget market and was barely profitable. But Midget has yet to miss a payment to its trade creditors or its owner's brother-in-law. When the firm first applied to Little Bank for a loan, a loan officer from the bank performed an especially careful analysis of Midget's books, made phone calls to the firm's trade creditors to ask about the firm's repayment history, and visited the widget plant to inspect the firm's inventories. In fact, this visit was only the first of many regular visits to the plant by the loan officer in charge of Midget's account.

After some careful discussions by the bank's lending committee, Little Bank decided that Midget was a good credit risk, in part because of its exemplary repayment history, but primarily because it was a promising business that had strong future prospects. The lending committee also decided that rather than burden Midget with very high loan payments at the outset—which might backfire and push the firm into early default—the bank would charge a loan rate of only prime plus 3 percent. This rate was not high enough to cover Little Bank's initial costs of investigating the firm plus its own funding costs (mainly the costs of paying de-

¹This article focuses on the empirical literature on bank lending in the United States. I have not always referenced seminal papers when later papers contain good discussions of the preceding literature. See the article by Sudipto Bhattacharya and Anjan Thakor for an excellent critical review of the theoretical literature, and the one by Leonard Nakamura for a discussion of both the empirical and theoretical literature.

²The story of Midget Widget is based primarily on three important articles, one by Allen Berger and Gregory Udell and two by Mitchell Petersen and Raghuram Rajan. Midget and all other firms and banks in this article are fictional, as are their stories.

positors), but the loan committee reasoned that these costs would be made up over time. Midget was a rapidly growing business, and Little Bank's lending committee agreed that even though the loan was risky, it was likely to be just the first in a series of future, more profitable loans.

But the initial nonprice contract terms were *very* stringent, designed to give Little Bank lots of leeway to intervene to protect its money. The loan was structured as a one-year commitment—so after only one year the bank could freely reevaluate the firm's creditworthiness—and Midget was required to post its accounts receivable as collateral. In fact, payments by those firms receiving trade credit from Midget were made straight to the bank, rather than to Midget. In addition, the loan agreement included numerous restrictive covenants, including the bank's right to veto asset sales by the firm and strict requirements that Midget limit borrowings from other sources.

Now, in the 10th year of this borrowing relationship, Midget's loan terms are much more attractive than at the outset. The firm now borrows at prime plus 1 percent, instead of the prime plus 3 percent that it paid initially. Instead of a one-year loan commitment, Midget now has a three-year commitment. Although the contract still has restrictive covenants, Midget's loan commitment is no longer collateralized, and the firm now receives all payments directly from its customers.

Midget can now borrow both more cheaply and without such intrusive bank controls because its default risk has dropped over time. Firms that fail are most likely to fail in their first few years of operation. After 14 years, it's clear that Midget is not a fly-by-night firm with a high risk of default. Also, it's now *cheaper* for Little Bank to lend to Midget. Over the last 10 years, the bank has developed expertise in understanding Midget's financial needs and problems, so new loan agreements and adjustments to old ones do not trigger the same in-

tensive evaluation as they did at the outset. Moreover, keeping close tabs on collateral is time-consuming, so a bank's lending costs fall when it feels secure enough to lend without collateral.

More attractive contract terms are not the only benefit of the firm's long-term relationship with the bank. Midget's owner feels fortunate to have received a loan commitment at all this year. The regional economy is weak, and as the regional market goes, so goes the market for widgets. Other area firms that have been in business at least as long as Midget have simply been unable to get a loan on *any* terms from a bank. But, unlike Midget, many of these firms have not had a long-term, exclusive relationship with a single bank. Little Bank's knowledge of the ins and outs of Midget's financial condition—through good times and bad—allows the bank to see Midget's fundamental strengths despite the local economic problems. Little Bank also feels a commitment to help Midget through difficult times.

...But Relationships Are Harder to Form in Highly Competitive Loan Markets. From Little Bank's viewpoint the relationship has developed much as the lending committee had hoped initially. The low initial loan rates (relative to the firm's risk of default) and high costs of monitoring Midget at the outset of the relationship—which initially yielded low profit margins—have been replaced by years of handsomely profitable loans. These continuing profits are rooted partly in the knowledge and expertise that Little Bank has built up over its 10-year relationship with Midget. Little Bank's greater experience in lending to Midget gives it an advantage over potential competitors for Midget's business, all of whom would find it expensive to reproduce Little Bank's knowledge in a reasonable amount of time. As its own costs of lending to Midget have fallen, Little Bank has passed on some of the cost reduction to Midget through a lower loan rate (and more relaxed contractual controls) and kept some of

the cost reduction for itself as higher profit. Even as Little Bank makes profits, it is hard for any competitor to offer Midget a better deal.³

Just how much profit Little Bank can keep as its lending costs fall—and how Midget's loan rate evolves over time—depends mainly on the number and behavior of Little Bank's competitors, including both banks and nonbank lenders (such as finance companies). When competition in the loan market is weak and the bank doesn't have to worry so much about a competitor's stealing its customer, the bank can take the entire future customer relationship into account when making a loan-pricing decision in a given period. As in Midget's case, a bank can profitably charge loan rates *below* (risk-adjusted) lending costs at the outset of the relationship—to keep the risk of early default by their risky borrowers low—knowing that it will be able to charge rates *above* lending costs as the relationship continues. In markets where competition is weak, the loan rate charged to a customer typically starts low and falls relatively slowly as lending costs fall over the life of the lending relationship. In more competitive loan markets, each bank will be more concerned about a competitor's stealing its customer at any time, which puts strong pressure on the

Banks in highly competitive loan markets don't have the luxury of taking temporary losses in the expectation of charging relatively high rates in the future.

bank to cover its lending costs *period by period*. Banks don't have the luxury of taking temporary losses in the expectation of charging relatively high rates in the future. So, in highly competitive markets, the loan rate charged to a customer usually starts high and falls more swiftly over the life of the lending relationship.

In Midget's view, more competition would certainly be welcome, as it would put pressure on Little Bank to lower its loan rate now. While grateful for Little Bank's initial commitment of funds and resources, Midget now views itself as an established firm that deserves low rates. But in Little Bank's view, its own current profits are merely compensation for its heavy initial expenditures on evaluating and monitoring

Midget's credit risk and for the relatively low loan rates that it charged Midget when it was only four years old and a relatively high-risk firm. Moreover, Little Bank would argue that it wouldn't have been willing to make such a risky loan *in the first place* without the expectation of high profits in succeeding years. And Midget might have had to wait until it had a longer track record to get outside funding.

An important lesson of Midget's story is that greater competition in loan markets can have complicated and surprising effects. Clearly, competition limits a bank's ability to increase loan rates and profits at borrowers' expense. But it also creates difficulties in building long-term relationships. In particular, it may be difficult for banks to make risky loans—for example, when firms are young and desperately in need of credit—unless the bank expects that it will ultimately profit over the life of the lending relationship. Both the competitive advan-

³Economists would say that Midget is *locked into* its relationship with Little Bank, because the bank has an information advantage over its competitors. Of course, other banks might learn something about Midget's creditworthiness based on Little Bank's willingness to make a loan. But as long as Little Bank's credit-granting decision does not completely reveal all relevant information about Midget, Midget will be locked in.

tage held by an incumbent bank, because of its prior relationship with the firm, and relatively noncompetitive loan markets increase the bank's profits over the life of a lending relationship.⁴

RELATIONSHIPS BECOME LESS EXCLUSIVE AS FIRMS BECOME LARGER

Exclusive Relationships Create Tensions. Middle Marketing (popularly known as 2M) is a closely held firm with \$50 million in sales, and it has been borrowing from Regional Bank for 15 years. Regional has been 2M's sole banker and, other than trade credit from its suppliers, 2M's only source of outside funds. While the relationship with Regional has been mutually beneficial, 2M is not completely satisfied. In fact, the firm's Treasurer has become increasingly dissatisfied as he has fielded phone call after phone call from Regional's competitors, who are also seeking to expand their presence in the middle market, and from investment bankers who are trying to convince 2M to go public.⁵

Although 2M no longer has to post collateral on its loans, its three-year loan agreement still has extensive covenants and contractual controls that the firm finds increasingly intru-

sive. Of course, 2M can always phone its account manager at Regional to request a temporary waiver or renegotiation of a covenant. For example, last year when new equipment purchases threatened to reduce 2M's liquid assets on hand and push its working capital (cash plus accounts receivable) below the minimum level stipulated in the loan contract, 2M's owner called Regional. After a review of 2M's books and some further discussions to make sure that the fall in 2M's working capital was not due to other, more ominous causes, Regional offered a temporary waiver of the covenant.⁶

But renegotiations are not always easy. Sometimes, Regional has demanded an increase in the loan rate in exchange for a relaxation of the covenant. Sometimes, Regional has demanded an offsetting tightening of another covenant. For example, during the last negotiations, although Regional allowed 2M's working capital to fall below the level usually considered prudent in the industry, it also demanded a reduction in the firm's debt-to-equity ratio. In fact, Regional and 2M have not always seen eye to eye about the risks of 2M's operating decisions, and the bank has not always agreed to contractual changes on any terms. Had Regional viewed 2M's recent decline in working capital as too risky, negotiations could easily have turned out unsuccessfully for 2M.⁷ In this case, the firm might have been forced to postpone the equipment purchase or to search for another banker willing to provide funds (after duplicating Regional's investigation of the

⁴This should *not* be interpreted as an argument that greater competition is a bad thing and should be discouraged, but only that there are both benefits and costs. In addition, monopoly profits are not the only way that a bank can receive compensation for its initial commitment of resources to a firm. For example, some economists have argued that holding equity stakes in firms could serve a similar function for a bank, even in highly competitive loan markets. This would require changes in laws that separate banking and commerce, which severely restrict bank equity positions in firms that are not in financial distress. Such legal changes might have complicated and far-reaching effects. For example, see the article by Loretta Mester.

⁵The middle market is a fairly nebulous place. Many commentators would say that it's populated by firms with sales between \$50 million and \$500 million in sales, but other numbers are often used.

⁶My account of renegotiations relies heavily on the articles in "A Forum on the Effects of Violating Debt Covenants," in the *Accounting Review*.

⁷Even when both the bank and the firm agree about the underlying riskiness of an operating decision, they may disagree about the desirability of the decision. As a creditor with a fixed claim, the bank has a tendency to be especially wary of risky decisions, because it does not share in the high returns when the decision turns out especially well.

firm's finances). Either outcome would have been costly for the firm.

To Reduce Lender Power, Larger Firms Often Seek to Diversify Their Sources of Funds...By diversifying the firm's funding sources, 2M's owner feels that she would gain more discretion over production and investment decisions and also more bargaining power in negotiations with Regional. One possibility is that 2M could simply borrow from multiple banks, including Regional. Another possibility—which entails more fundamental changes in the ways that the firm does business—is that 2M could sell securities to the public in an initial public offering (IPO). 2M is now large enough to bear the costs of selling public securities, which include the substantial and ongoing costs of providing information both to investors and to the SEC, as well as the fees paid to the underwriting firm that brings the company's securities to market. Since 2M's owner has been looking to diversify her personal portfolio by reducing her large stock holding in the firm, 2M elects an IPO.

...But Large Firms' Public Security Holders Continue to Value Bank Relationships. Although the decision to sell public securities will ultimately weaken the intensity of 2M's relationship with Regional (indeed, this is one of the reasons for 2M's decision), the firm will continue to benefit from maintaining a lending relationship. In fact, one of these benefits will be felt immediately.

One of the enduring empirical puzzles in financial economics is that stock sold in an IPO seems to be *underpriced*, in the sense that the initial buyers can turn around and resell the stock at a higher price. There is no consensus about why IPOs are underpriced, but most economists believe that it's related to investors' uncertainty about the quality of a firm new to public markets; thus, less uncertainty about the firm's prospects would reduce the amount of underpricing.

This is just what 2M's relationship with Re-

gional appears to do. Otherwise suspicious investors act as if they view a prior borrowing relationship with a bank as good news about the firm, a type of Good Housekeeping Seal of Approval, which reduces their uncertainty about the firm's future prospects. 2M can reasonably expect that its own stock will sell at a higher initial price than that of a similar firm that doesn't have an ongoing relationship with a bank. So, in 2M's case, the extent of underpricing is likely to be reduced, which is good for 2M, since the firm will get more funds from investors when it sells its securities.⁸

After 2M has gone public, its relationship with Regional will continue to affect the price of its public securities. This is true even though a firm with publicly traded securities must disclose a lot of information about its business affairs so that investors and analysts can form their own opinions and make their own forecasts about the firm's prospects. Investors will continue to react whenever 2M renews or renegotiates its loan commitment with Regional. As long as the new contractual terms do not indicate a worsening of 2M's financial situation—say, a higher rate than in the previous loan commitment—2M's stock price will typically rise with the public announcement of the new loan contract.

This positive stock-price reaction to announcements of bank loans and loan commitments—an effect that has been found in study after study—stands in sharp contrast to the usually insignificant or negative effect of the announcement of a new public debt issue.⁹

⁸The evidence about bank relationships and IPOs can be found in two articles, one by Christopher James and Peggy Weir and another by Myron Slovin and John Young.

⁹The positive stock price effect when a loan agreement is announced is significant only when the number of banks lending to the firm is small (as discussed in the next section).

Investors' willingness to pay more for the firm's stock suggests that they view the renewal of the loan relationship (on favorable terms) as good news about its future prospects, either because the bank's information about the firm's condition is superior to that of other investors—*bank certification*—or because the firm's stockholders believe that close supervision by the bank of the firm's affairs is likely to improve the firm's performance—*bank monitoring*.

The positive effect of such an announcement has been found to be strongest when markets are uncertain about the firm's prospects—for example, when stock analysts have substantial disagreements about the firm's future earnings—or if the firm's stock price has been low and investors have been pessimistic about the firm's earnings prospects. This effect has also been found to be strongest when the *bank's* credibility—as measured by its credit rating—is greatest. All of these findings support the idea that investors place a value on the lending relationship.¹⁰

The story of 2M illustrates that the nature of the lending relationship changes over a firm's life-cycle. The tensions of exclusive lending relationships create powerful pressures for firms to diversify their funding sources when they become large enough. Further, the lend-

ing relationship itself eases the transition from exclusive borrowing from a single bank to diversified funding, especially borrowing on public markets. But even when a firm secures funds from public securities markets, there is a pay-off to the firm that maintains ties with its banker, because the banking relationship continues to convey information to investors.

A FIRM'S ACCESS TO PUBLIC DEBT REDUCES THE BANK'S FLEXIBILITY

While the empirical evidence says that banks play a continuing role in evaluating and monitoring firms with public securities—at least until the firm reaches a very large size—another aspect of the lending relationship seems to undergo a fundamental change when the relationship becomes less exclusive. The ease of renegotiating bank loans, often seen as one of the hallmarks of lending relationships, appears to suffer.

One piece of evidence that illustrates this loss of flexibility is that the positive stock-price effect of a loan announcement depends on there being a small number of lenders. Many firms borrow from a syndicate of banks: one bank negotiates the loan commitment agreement on behalf of a number of other banks, but all members of the syndicate must ratify any adjustments in the loan agreement. When the loan agreement involves a syndicate of more than three banks, the positive effect of the loan announcement on the firm's stock price disappears.¹¹ This finding makes sense because it is more difficult to renegotiate loans with a syndicate of banks than with just one or two banks; monitoring and controlling the firm through

¹⁰A thorough review of the literature on the stock-price effects of loan agreement announcements can be found in the article by Matthew Billet, Jon Garfinkel, and Mark Flannery. This article also performs an especially careful reexamination of prior findings. Notably, the authors call into question two earlier findings. Initial evidence indicated that only bank loans—and not other types of private debt—have positive announcement effects. Billet, Garfinkel, and Flannery summarize and add to the mounting evidence that all types of private debt have positive announcement effects. They also cast serious doubt on the prevailing belief that announcement effects are significant only for renewals and renegotiations of loan agreements, but not for first-time agreements between firms and banks. Instead, they find that announcement effects are positive and significant for both renewals and first-time agreements.

¹¹The empirical evidence on the stock-price effect of loan commitments by lending syndicates can be found in the article by Diana Preece and Donald Mullineaux. Their article considers—and rejects—a number of alternative explanations for the insignificant stock-price effects of large syndicated loans.

covenants is much more valuable when contractual terms can be readily revised as new information arrives and circumstances change. In effect, syndicated loan agreements are more like public debt—which is difficult to renegotiate—than a traditional bank loan.

And when the firm actually has public debt—even just a little—bank debt is no longer so easy to negotiate when a firm is in financial distress. Consider Q Continuum Castings, which has sales of \$250 million.¹² Its only bank is Mostly Derivatives Bancorp (MDB), which provides Q with most of its short-term financing. In 1987 Q issued its first public debt, following many other middle market firms that had entered public debt markets for the first time. The debt was used to finance the purchase of a small HMO, a testament to Q's forward-looking management, but a business outside Q's core market. This public debt represents only about 15 percent of Q's total debt financing, and MDB holds virtually all of the rest of Q's debt.

For two years, sales of castings have been lagging while the HMO business has been booming. But since the HMO is only a small part of Q's businesses, it now appears that the firm will default on its loans to MDB unless it can somehow reduce its debt payments. Q has already entered negotiations with MDB, be-

cause its current ratio (working capital divided by total assets) has fallen below the minimum specified in its loan agreements, placing the company in *technical default*. As is common in loan contracts, a technical default must be remedied within 60 days, or MDB has the right to demand immediate repayment of the loan.

During negotiations, Q argues that the dol-drum in the castings market are only temporary and also notes that its HMO subsidiary is doing very well. The firm asks MDB to transform half of its short-term loans into long-term loans with lower face value and to exchange the remainder for a substantial share of Q's stock.

These changes would have the effect of reducing Q's current interest payments and postponing payments to the bank to the future, which the firm is convinced will be brighter.

MDB agrees that the long-term prospects in the castings market are reasonably favorable, but it makes a counterproposal. First, all of Q's public bondholders must exchange one-half of *their* bonds for stock. Second, the bank will allow Q to stretch out its short-term loan payments, but it will not reduce the face value of its debt. Third, MDB demands that Q sell off the HMO and use the proceeds from the sale to retire some of its bank debt. Finally, the bank demands a first lien on the machines used to produce castings, that is, Q's casting equipment will now serve as collateral for the bank's loans.

The bank explains both its refusal to accept the company's offer and its own counteroffer as follows. The pain must be shared among all claimants, and it is not the bank's responsibility to bail out Q's bondholders. If the bank writes down the face value of the debt and receives stock in exchange, Q's bondholders will

Even a small amount of public debt creates a conflict between the interests of the bank and those of the firm's bondholders.

¹²The story of Q is based on numerous articles, but it relies most heavily on a pair of significant papers by Christopher James. These articles contain extensive bibliographies and good discussions of the previous empirical work on banks' role in debt renegotiations for financially distressed firms.

be receiving substantial interest payments while the bank waits for Q's finances to improve enough to begin paying dividends. And in the worst possible case, if Q does not recover and enters bankruptcy, the bank's claim would be subordinate to those of bondholders. This means that the bondholders would be paid off, while the bank would be left with an equity share that may turn out to have little or no value. By forcing Q to sell its valuable HMO subsidiary to retire bank debt and by taking collateral in the castings business, MDB guarantees that it will recover at least some of its investment, even in this worst possible case.

Although Q's management and its public bondholders feel that MDB is taking an unreasonably harsh stance, they have little choice but to accept. As a result of these renegotiations with MDB, Q does avoid the bankruptcy courts, which usually eat up valuable resources like management time and attention, not to mention expenses such as court and lawyers' fees. Yet, the firm has lost its prized jewel (the HMO), and Q's bondholders have been forced to shoulder a disproportionate share of the concessions.

The first lesson of the story of Q is that even a small amount of public debt creates a conflict between the interests of the bank and those of the firm's bondholders. The source of this conflict is that the bondholders are the primary beneficiaries if the bank takes a conciliatory stance in debt renegotiations—for example, by taking equity in the firm or forgiving principal payments. The firm's public debt tends to *harden* its bank's bargaining position, as the bank makes sure that it does not bail out the firm's bondholders by making concessions.

However, the second lesson is that Q's primary reliance on bank loans *does* ease negotiations to avoid a costly bankruptcy. After all, it would have been much more difficult for Q to achieve an agreement with the bondholders alone. MDB is well informed about Q's finances because of its relationship with the firm, and one-on-one negotiations between two well-in-

formed parties—Q's and MDB's managers—are likely to be better organized and less fractious than negotiations with bondholders. Even though the bondholders realize that MDB's interests and their own conflict, they also know that as Q's main creditor the bank stands to lose a lot if it permits the firm to continue operations and Q ultimately fails. MDB's willingness to renegotiate, rather than pull the plug and demand immediate repayment, signals to Q's bondholders the bank's informed belief that the firm is more valuable as an ongoing business. This makes them more likely to exchange their debt for stock.¹³

CONCLUSION

The empirical literature of the last 10 years has uncovered some interesting lessons about the advantages and disadvantages of relationship lending and about the ways that lending relationships change as competitive conditions facing a firm change. Where firms have limited financing choices—for example, small firms—relationship lending generates real benefits. Relationship lending is characterized both by close monitoring of the firm by the bank and by contractual flexibility. The possibility of long-term lending relationships may make it easier for small, risky firms to borrow outside funds, but firms inevitably seek out more diversified funding sources when these become available. Indeed, a firm's prior relationship with a bank makes it easier for the firm to gain access to public securities markets, and even when the firm can issue public securities, bank relationships continue to play a role. For all but the larg-

¹³In his 1995 study, James also finds that bank equity participation in a debt restructuring is associated with superior performance by the firm over the succeeding three years. This finding is tantalizing, but it is particularly difficult to disentangle the direction of causality. Did the bank take equity because of the firm's superior prospects, or did the firm prosper because the bank took equity?

est firms, banks continue to have an informational advantage that markets recognize. But diversification of funding sources severely limits the bank's willingness to be flexible when firms enter financial distress, even when firms

have only small amounts of public debt. Nonetheless, a close relationship with a bank does increase the likelihood of successful renegotiation when a firm enters financial distress.

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The Suburban Housing Market: The Effects of City and Suburban Job Growth

*Richard Voith**

How does the location of new jobs in a metropolitan area affect the suburban housing market? Economists expect job growth to increase the demand for housing, and furthermore, they expect the increase in demand to be greater in communities near the new jobs than in more distant ones. Moreover, growth in jobs with higher wages should increase the demand for housing more than growth in jobs with lower wages. Increases in housing demand, in turn, put upward pressure on house prices and

construction rates. The market response to an increase in housing demand, however, will depend on how easily the supply can adjust to shifts in demand. Because of differences in proximity, wages, and housing supply, city employment growth may have dramatically different effects from suburban growth on house prices and construction rates across suburban communities. These housing market effects provide a window through which we can evaluate the overall economic contributions of city and suburban job growth as well as insights into who benefits from city and suburban job growth.

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JOB GROWTH AT EMPLOYMENT CENTERS AND ON THE URBAN FRINGE

Job growth in a metropolitan area may be widely dispersed geographically, or it may occur in clusters. In its most extreme form, dispersed development is accommodated by widening the boundaries of the urbanized area rather than by increasing the density or number of jobs in areas already developed.¹ Job growth in clusters, on the other hand, results in more intensive use of space in existing employment centers. Development at employment centers occurs both in the suburbs and in the city. We will refer to widely dispersed job growth that occurs primarily on the urban fringe as decentralized job growth and growth in clusters as centralized growth.

With decentralized development, agricultural land is converted to commercial uses, and the demand for houses near the urban fringe increases. Because a great deal of open land is available, increases in housing demand are met by the construction of new houses. Price increases for existing houses are limited by the cost of new construction. In economists' terms, housing supply is elastic on the urban fringe—shifts in demand cause small changes in price but large changes in the rate of construction. (See *Prices, Construction Rates, and the Elasticity of Supply*.) While decentralized job growth tends to increase construction rates on the urban fringe, it may have little effect on either prices or construction in neighborhoods away from the fringe because the number of jobs accessible to these communities is essentially unchanged. Finally, if decentralized growth occurs at the expense of jobs in existing employment

centers, it may reduce the demand for housing near these centers. This would tend to reduce housing prices and, to a lesser extent, the number of houses in these areas.

Centralized job growth, on the other hand, increases the demand for housing in communities with easy access to the employment center. Because these neighborhoods tend to be densely developed, it is difficult to construct new housing. Housing supply in these communities is inelastic—increases in demand tend to drive house prices up, with little or no impact on construction. Centralized employment growth, in theory, should have price impacts that decline with distance from the center. Distant communities may even experience a decline in demand if centralized job growth is a result of shifts in employment from the urban fringe to employment centers.

Basic models of urban economies highlight the role of centralized production and the importance of proximity to these employment centers for property values.² The earliest models assumed that all production occurred in the center of the area and everyone commuted to the central area to work. Workers seeking to avoid high commuting costs bid up prices near the employment center so that the value of land fell as distance from the center increased.

Rather than maintaining the unrealistic assumption that all production occurs in the center, more recent models consider both centralized and decentralized employment.³ A basic assumption of many of these models is that firms locate near one another because doing so has economic advantages: workers are more

¹Metropolitan areas generally consist of one or more counties. Within the boundaries of the metropolitan areas, there are usually one or more central cities, suburbs surrounding the central cities, and land used for agriculture beyond the suburbs. Taken together, the central cities and the suburbs constitute the urbanized area, and the agricultural land adjacent to the urbanized area is the **urban fringe**.

²See the articles by Edwin Mills and Richard Muth for a discussion of equilibrium models of monocentric urban economies, that is, economies in which there is a single focal point where production occurs.

³The papers by Arthur Sullivan, Jan Brueckner, and Michelle White are good examples of monocentric urban models with decentralized employment.

Prices, Construction Rates, and the Elasticity of Supply

Markets adjust to achieve equilibrium in two ways: by changing the price of goods traded and by changing the quantity of goods traded. Given a shift in housing demand, the extent to which the adjustment will be accomplished by price changes or by new house construction will depend on the elasticity of supply. Economists define the elasticity of supply as the percentage change in quantity divided by the percentage change in price. If the change in price is greater than the change in quantity, supply is said to be inelastic (Figure A); if the change in quantity is greater than the change in price, supply is said to be elastic (Figure B).

FIGURE A

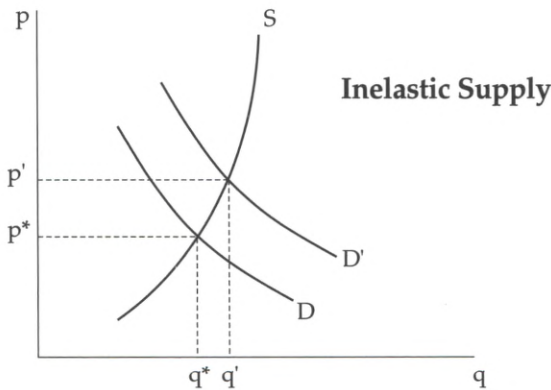


FIGURE B

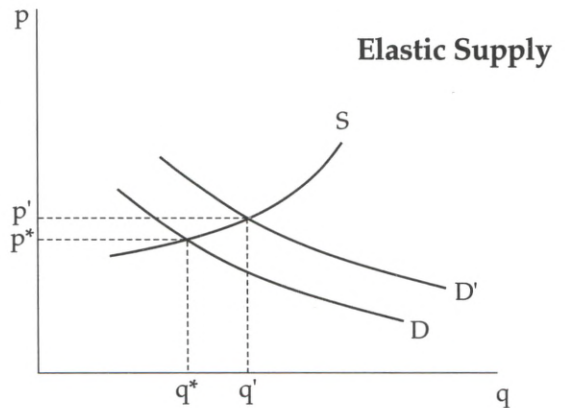


Figure A shows the equilibrium price, p^* , and quantity, q^* , with demand curve D and supply curve S . A shift in demand from D to D' results in a shift in quantities to q' . The supply curve is almost vertical, indicating that an increase in price changes quantity supplied very little; hence, supply is inelastic. Thus the new equilibrium is achieved with a greater shift in price than in quantity. If supply were perfectly inelastic, the quantity supplied would not change at all with a change in demand, and all adjustments would be achieved by changing prices. Inelastic supply corresponds to the housing market conditions in older, densely developed neighborhoods.

Figure B shows a similar diagram, but this time with a flatter supply curve. In this case, the shift in demand results in a much greater shift in quantity than in price. The flatter supply curve indicates that small changes in price induce large changes in quantity; hence, supply is elastic. If the supply curve were perfectly flat, shifts in demand would not affect price; only quantity would change. Elastic supply corresponds to housing market conditions in communities on the urban fringe.

productive in areas where a lot of economic activity occurs. Economists call these advantages “agglomeration economies.” While agglomeration economies induce many firms to concentrate in commercial centers, other firms still choose decentralized locations.⁴ Noncentrally located firms offer lower wages, but some workers choose to work at these firms

because their commuting costs are lower. These expanded models, which provide a rationale for both centralized and decentralized employ-

⁴It is likely that firms choosing central locations are ones that can benefit the most from agglomeration economies, while those choosing decentralized locations are in businesses that do not benefit from agglomeration.

ment, still predict that land prices decline with distance from employment centers.

There is a long tradition of estimating the relationship between housing prices and distance to high-productivity employment centers.⁵ Changes in this relationship are of interest because they provide insight into the change in the benefits of agglomeration over time.⁶ There is little analysis, however, of the consequences of shifts in production between centralized and decentralized locations. Such analysis could provide insight into who benefits and by how much from the change in land values associated with centralized or decentralized job growth.

Homeowners and developers may have divergent interests in the pattern of job growth. Employment growth in existing centers, such as the central business district (CBD), is likely to enhance the value of existing houses near job centers. Decentralized growth at the urban fringe is likely to result in shifts of agricultural land to residential use, but it will have little or no impact on the price of existing houses. De-

⁵See the articles by Paul Waddell, Brian Berry, and Irving Hoch; E. Heikkila and colleagues; and John McDonald and Daniel McMillen for analyses of land value gradients in a polycentric context. In a monocentric setting, there is mixed evidence on the relationship between land values and distance from the central business district. Analyses by M. Cropper and Peter Gordon; the article by E. Heikkila and colleagues; and my 1991 article find either a positive or insignificant relationship between land prices and distance. Other studies, such as the one by Rena Sivitanidou in 1996 and my 1993 article, find the expected negative relationship. See the article by J. Jackson for a review of earlier studies.

⁶While the relationship between land prices and distance should reflect the value of agglomeration, researchers have generally focused on the relationship between population density and distance to evaluate the relative importance of basic economic factors such as technology and income compared with urban problems such as crime to the process of decentralization. See the article by Edwin Mills and Peter Mieszkowski for a review of this literature.

velopers and owners of agricultural land are thus the primary beneficiaries of the demand shift associated with decentralized growth.

Centralized and decentralized employment growth also have a potentially different impact on the total value of land. To the extent that centralized employment is more productive than decentralized employment, it will have a larger impact on total land value. Of course, the distribution of jobs is a result of choices by individual firms, which can best decide where their workers are most productive. In a perfectly competitive market with no spillovers, the location decisions of individual firms should result in the most efficient total production and ultimately the highest total value for residential land. But the basic notion of agglomeration economies is that an individual firm's choice of location affects other firms.⁷ One firm's decision to move out of the CBD has negative consequences for the remaining firms, which lose some of the benefits of concentration. The firm choosing to leave does not have to pay the costs imposed on other firms. Thus, private incentives may result in an inefficiently rapid pace of decentralization and lead to less efficient production and lower total land value.

EMPLOYMENT GROWTH AND HOUSING IN GREATER PHILADELPHIA

In a recent paper I estimated the effects of city and suburban job growth on the housing market in Montgomery County, Pennsylvania, in the Philadelphia suburbs.⁸ In my study, suburban employment growth included job growth

⁷Agglomeration economies are like a local public good—everyone choosing to locate in the community benefits from it. Standard microeconomic theory suggests that the competitive market will result in an inefficiently low level of local public goods.

⁸My 1996 paper provides a complete description of the analysis.

in Montgomery County and three neighboring suburban counties, and city employment growth included only that in the city of Philadelphia (Figure 1). While city and suburban job growth do not exactly correspond to centralized and decentralized job growth, we expect that the impact of city growth should be more like that of centralized growth.⁹ To the extent that suburban job growth is widely dispersed and occurs substantially on the urban fringe, we expect the effects of suburban growth to be more like those of decentralized growth.

The data for the study include more than 88,000 sales of single-family detached houses from 1972-95. Detailed information, such as sale price, year of sale, characteristics, size, and location, is available for each house. Since the data set also includes information on virtually all houses in Montgomery County, their construction date, and their census tract, we can deter-

mine the rate of new construction annually for each census tract and the average real appreciation and construction rates over the sample period (Figures 2a and 2b).¹⁰ The figures show that prices and construction rates vary a great deal over time. This variation in appreciation

¹⁰The data come from the 1988, 1994, and 1995 tax-assessment files of Montgomery County. The appreciation rates are based on 1990 constant dollars.

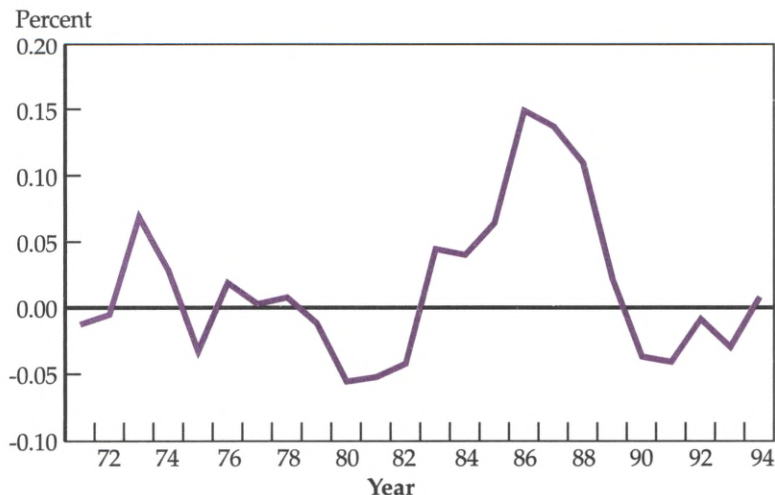
FIGURE 1
Philadelphia and the Pennsylvania Suburbs



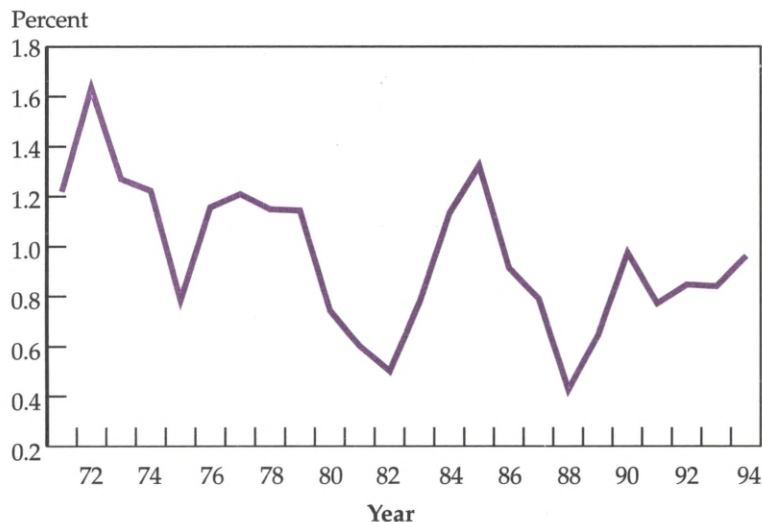
⁹ Because of the high density of both employment and population throughout the city of Philadelphia, all city job growth is thought of as centralized growth, which increases the intensity of land use in the existing communities. This is not necessarily true for all central cities in the United States, since some central cities have significant amounts of agricultural land within their boundaries.

FIGURE 2
**Montgomery County
 Single-Family Detached Houses**

A. Price Appreciation



B. Growth in Housing Stock



and construction rates is, in part, related to employment growth. Moreover, appreciation and construction rates vary greatly across communities, and these differences are linked to the patterns of employment growth. There are substantial differences in the movements of city and suburban job growth (Figure 3). While suburban growth rates are almost always larger than city growth rates (city growth rates are predominantly negative), the difference in city and suburban growth rates varies substantially over extended periods.

To evaluate the effect of city and suburban employment growth on suburban house prices and construction rates, we constructed a statistical model to take into account as many factors affecting house prices as possible, including the characteristics of the house such as its age, number of rooms, and number of bathrooms, as well as the size of its lot, its location, and the neighborhood.¹¹ After controlling for these influences on price, we evaluated the effects of city and suburban employment on price and whether the effects differ systematically with accessibility to the city. Similar

analyses were undertaken with regard to factors that affect construction rates.

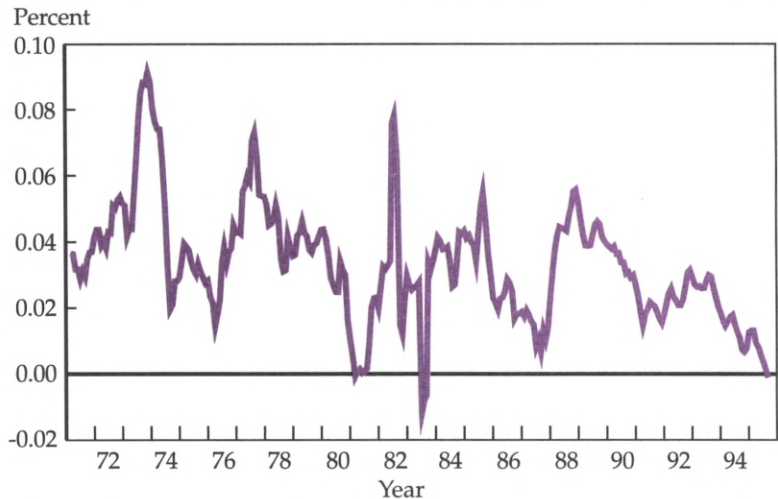
Employment Growth and House Prices. Our statistical models of house prices suggest that city and suburban growth have very different effects on the suburban housing market, and the effects vary dramatically across suburban communities. Our simplest model, which is designed to capture the overall effect of city and suburban employment growth on house prices, reveals that city employment growth has a positive effect on suburban house prices. Our estimates indicate that an increase in city job growth of 1 percentage point raises average suburban house values slightly more than \$1000.¹² Suburban employment growth, on the other hand, has virtually no effect on average house prices. The estimated average effects, however, mask large differences in effects across communities.

More complex statistical models allow the effects of city and suburban employment growth to vary depending on the community's

¹¹A common technique used in housing economics is hedonic regression. In this type of analysis, housing prices are regressed on housing and neighborhood traits. The estimated coefficients represent the "price" of individual housing traits such as number of rooms, number of bathrooms, and so forth. Housing traits and their estimated prices explain much of the variation in house prices.

¹²This estimate is based on Table 3, column 3, of my 1996 article. Based on transactions in the period from 1990-95, the average house price was \$166,900, which implies that a 1 percentage point increase in city growth increases average suburban house values about 0.6 percent.

FIGURE 3
**Employment Growth:
Suburban Rate Minus City Rate
(3-Month Moving Average)**



accessibility to the city, either by commuter train or by highway. For every 1 percentage point of growth in city employment, communities with commuter rail service enjoy an increase in house values that is more than \$1500 greater than communities without train service.¹³ (The reverse is true as well: when city employment shrinks 1 percentage point, the value of these houses falls.)

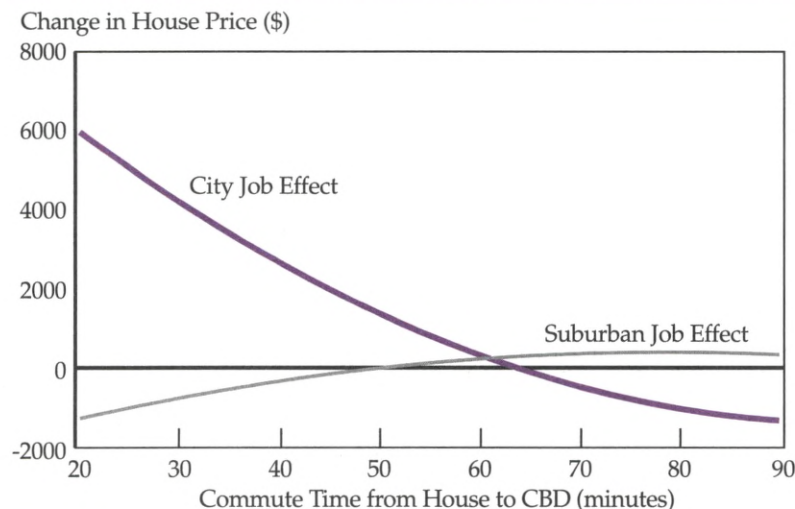
The differential effects of accessibility and employment are even more pronounced when we look at highway commuting times.¹⁴ The effects of an increase of 1 percentage point in

¹³These estimates are based on the model shown in Table 4, column 1, of my 1996 article.

¹⁴Again, these estimates are based on the model shown in Table 4, column 1, of my 1996 article. The effects are for a typical house in an average neighborhood. Because 42 percent of houses are in communities with train service, these effects include 42 percent of the estimated effect of employment growth on house values in communities with train service.

FIGURE 4
**City and Suburban Job Growth and
 House Prices***

The effects vary by distance from the CBD.



*The city effects are for a 1-percentage-point increase in city job growth, holding suburban employment growth constant. Similarly, the suburban effects are for a 1-percentage-point increase in suburban employment, holding city job growth constant.

either city or suburban employment growth vary with commuting time to the CBD (Figure 4). The vertical axis of Figure 4 shows the effect on prices, and the horizontal axis gives the distance from the CBD. For the communities closest to the CBD—about a 20-minute commute—a rise in city employment growth of 1 percentage point increases house values more than \$5900. The same amount of growth reduces house values in the most distant communities about \$1300. Thus, the difference in the impact of city job growth on house prices across communities is about \$7200.

The negative effect of city job growth on more distant communities implies that employment growth must be correlated with other factors that affect the relative attractiveness of the city and suburbs. Note that for city employment

growth to have a negative effect on distant suburbs, people must be choosing to live closer to the CBD for reasons other than commuting. Perhaps city employment growth is correlated with improved, regionally valued amenities located in the city, which induce more people to choose locations that are closer in.¹⁵

The effects of suburban job growth on house prices are relatively small. For a rise of 1 percentage point in suburban growth, communities near the city suffer price declines in the range of \$1300, and prices in distant communities increase a scant \$300. The difference across communities is a relatively small \$1600. The price decline

in communities near the city may reflect other factors that both lower the attractiveness of the city and increase job growth in the suburbs. This explanation is supported by the finding that suburban job growth has no differential impact on communities with or without train service to the CBD.¹⁶

In summary, our estimates imply that—at

¹⁵The estimates give the effects of city growth, holding the rate of suburban growth constant. Thus city employment reduces house values in distant suburbs even though city growth does not change the rate of suburban growth.

¹⁶It is not surprising that suburban growth has no differential effect on communities with or without train service, since train service adds little to accessibility to suburban jobs.

least in the Philadelphia area—city employment growth has a significant, positive impact on suburban house prices while suburban employment growth, on average, does not. City employment growth has a strong differential effect on suburban house prices in communities with train service while suburban employment growth does not. While both city and suburban employment growth affect communities differently according to their distance from the CBD, the effects are much larger for city than for suburban employment growth. In general, these findings are consistent with the idea that the supply of housing is inelastic in older communities near the city and elastic near the urban fringe.

Employment Growth and Housing Construction. Markets adjust to changes in demand by shifting not only prices but also quantity. Quantity adjustments in response to new job creation are affected by other factors such as the availability of land (density) and mortgage interest rates. Therefore, we take into consideration the effects of density and mortgage interest rates in estimating the effects of job growth on housing construction.¹⁷ Density is a good measure of the potential that a community has for new residential development. Communities with high density should have low construction rates because little open space is available for new construction.¹⁸ Mortgage interest rates affect both the cost of financing construction for developers and the cost of financing purchases by home buyers.

On average, the annual rate of construction

¹⁷In our statistical model, density has a very large negative impact on construction rates. Mortgage rates also have a negative, statistically significant effect.

¹⁸In a given year, an average of 42 percent of all census tracts have no new construction. The fact that observed construction rates are frequently zero necessitates the use of the Tobit procedure to estimate the construction models.

for new, single-family detached housing in Montgomery County is about 1 percent of the total housing stock. City and suburban employment growth have opposite effects on countywide construction rates. We estimate that an increase of 1 percentage point in city job growth reduces the construction rate a little more than 0.1 percent.¹⁹ That is, the average annual construction rate falls from 1 percent to about 0.9 percent. Suburban growth increases the average construction rate by a similar magnitude: an increase of 1 percentage point in suburban job growth raised the construction rate to almost 1.09 percent.

As with price effects, there are large differences in the effects of job growth on construction rates among suburban locations.²⁰ The impact of city employment growth on suburban construction rates is an increase of 0.03 percent in communities within a 20-minute commute, but in the most distant communities, city employment growth reduces construction 0.27 percent (Figure 5). Thus, a healthy city economy reduces the relative attractiveness of the most distant communities. The effects of suburban job growth also differ by location. An increase of 1 percentage point in suburban employment growth raises the construction rate in distant communities 0.21 percent but has little effect on close-in communities. This suggests that new suburban jobs are truly decentralized; that is, they occur primarily at the fringe of the metropolitan area.

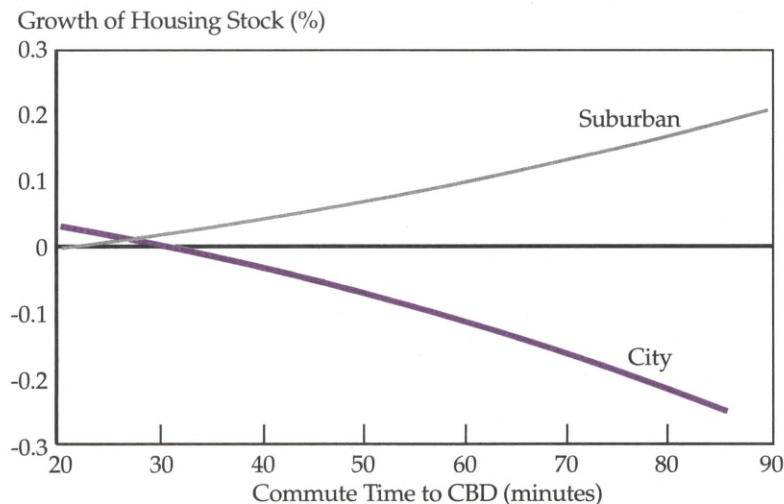
SHOULD WE CARE ABOUT THE GEOGRAPHY OF JOB GROWTH?

There are two broad reasons why we should care where growth occurs: economic efficiency

¹⁹All estimates in this section are based on Table 6, column 1, in my 1996 article.

²⁰Unlike the case with price effects, there were no differential effects across communities with and without train service for either city or suburban employment growth.

FIGURE 5
**City and Suburban Job Growth and
 the Rate of House Construction***
 The effects vary by distance from the CBD.



*The city effects are for a 1-percentage-point increase in city job growth, holding suburban employment growth constant. Similarly, the suburban effects are for a 1-percentage-point increase in suburban employment, holding city job growth constant.

and distribution of economic impacts. Questions about efficiency focus on which type of employment growth generates the greatest output for the region. Questions about distribution, on the other hand, focus on who benefits from city and suburban employment growth. When evaluating the efficiency and distributional issues associated with city and suburban job growth, we need to combine the findings from the price and quantity sides of the housing market to determine the total impact.

Efficiency. When the average productivity in a metropolitan area is high, people and firms

²¹Of course, there are many other factors that affect people's choice of where to live, but for similarly attractive metro areas, higher productivity should increase land value.

will be willing to pay more to locate there.²¹ Therefore, one way to evaluate the overall efficiency of city and suburban growth is to compute which form of growth contributes more to the total value of land. The data in our study were limited to one suburban county, so we cannot evaluate the effect of job growth on the overall Philadelphia metropolitan area. But we can evaluate the effects of city and suburban job growth on the total value of residential land in Montgomery County.²²

There are two elements in the calculation of the impact on residential land value from any job growth: the change in values for existing

houses and the change in property value associated with the construction of new houses.²³ First, consider the effects of city employment growth. The house-price models imply that an increase of 1 percentage point in city employ-

²²This analysis is further limited to the effects on the value of single-family detached dwellings.

²³Calculating the change in residential land values resulting from new construction is complicated by the fact that, ideally, we would like to know the difference between the value of land before and after new construction. We do not have a good measure of the value of vacant land or of the value of land after construction. We assume that the value of vacant land is zero and the value of newly developed land is equal to the average tract price, including housing. Thus, our estimate of the impact on land value represents an upper bound.

ment growth raises the aggregate value of residential property 0.58 percent.²⁴ Recall that an increase of 1 percentage point in city job growth reduces the rate of construction 0.1 percent, that is, the rate of construction falls from 1 percent of the total housing stock per year to 0.9 percent per year. This translates into a decrease in value of 0.1 percent from what the county would have experienced otherwise. The net impact of city job growth, therefore, is an increase in residential value of 0.48 percent. The positive effect on price far outweighs the negative impact of city job growth on suburban construction. Next, consider the effects of suburban job growth on residential values. Suburban growth has virtually no impact on prices, but it does have a positive impact of 0.09 percent on construction. Thus, the effect of employment growth on construction causes suburban growth to have an overall positive impact on residential value, but the magnitude of the overall impact is about one-fifth the impact of city job growth.

If there are no differences in productivity between centralized and decentralized growth, the impacts of city and suburban growth should be similar in magnitude, so the above difference in the total impact implies that centralized employment tends to be more productive than decentralized employment. This immediately raises the question of why suburban employment is growing while city employment is declining, and this question has essentially two possible answers. First, there may be negative spillovers from the decentralization of jobs. The choice by individual firms to leave the city may have negative effects on the remaining firms, which in turn may induce additional firms to leave. As we discussed earlier, this process may lead to an inefficiently rapid pace of decentrali-

zation. Second, the higher compensation for jobs in Philadelphia may no longer reflect the true productivity differential between city and suburban employment, and thus we are simply in a transitional state in which relative wages between the city and suburbs are still adjusting. Because wages have not completely adjusted, jobs are moving out of the city. Of course, this second explanation can be a result of either technological forces favoring decentralized production or an inefficient loss of agglomeration economies.

Distribution. While the differences in the impact of city and suburban job growth on the total value of residential real estate are significant, the differences across communities are even more dramatic. These differences are illustrated by the estimated effects of city and suburban job growth for two Montgomery County communities: Narberth and Salford. Narberth is a small, old, relatively dense community that lies 24 minutes by highway from the Philadelphia CBD. It also has train service. Salford is a community nearer the urban fringe, with low population density and no train service, and getting to the Philadelphia CBD entails a 77-minute commute.

We estimate that an increase of 1 percentage point in city job growth will increase the value of residences in Narberth 3.15 percent, but house values in Narberth will suffer a decrease of 0.47 percent when suburban job growth increases 1 percentage point.²⁵ If we use an average house price of \$196,300 in Narberth, job growth of 1 percentage point in the city would increase the value of a house \$6180; similar job growth in the suburbs would reduce its value \$920.²⁶ On the other hand, house values in

²⁴See my 1996 article for details of this calculation. These calculations assume that the new construction is valued at the mean value of houses in the county.

²⁵These estimates include the value of both price and construction impacts.

²⁶The average sales price is based on transactions occurring in the period 1990-95.

Salford would suffer a decline of 1.38 percent if city jobs grow 1 percentage point but would gain 0.39 percent from similar suburban growth. Since the average house value in Salford was \$133,300, these estimates translate into a loss of \$1840 from city growth and a gain of \$520 from suburban growth. The finding that job growth can negatively affect total value in distant communities—city growth has a negative effect on Salford, and suburban growth has a negative effect on Narberth—indicates that employment growth in a community tends to make communities more attractive for reasons other than simply the availability of jobs. For example, communities experiencing job growth may be in a better position to provide quality education, security, and other amenities to their residents.

SUMMARY

While our analysis of the relationship between the housing market and employment growth indicates that employment growth increases the value of real estate assets, all suburban residents do not share equally in the increase. Older, developed suburbs and suburban fringe communities do not have common interests, at least in terms of the patterns of economic growth and their effect on the housing market. Decentralized job growth increases the value of land on the urban fringe, and owners of agricultural land and developers are the prime beneficiaries. Centralized job growth, on the other hand, enhances property values in existing communities, and unfortunately, a decline in centralized jobs reduces the value of these properties.

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