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Proximity to urban centers in mergers and acquisitions

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Abstract

Purpose – The purpose of this paper is to examine the impact firm proximity to financial centers has on announcement returns and time to deal completion for mergers and acquisitions.
Design/methodology/approach – Using a data set of merger and acquisition activity from 1986 to 2014, target and acquiring firms are classified as rural or urban based on their geographic proximity to major financial centers. The impact of this proximity on short-term acquisition announcement returns and on the amount of time required to complete the transaction are tested.
Findings – Markets react more favorably to the acquisition of firms headquartered in a rural area, likely due to increased information advantage on the part of the acquiring firm. Furthermore, the acquisition of a rural firm requires greater time to completion.
Practical implications – Acquiring firms may be able to use information asymmetry to their advantage when acquiring firms located in a more rural setting with higher levels of information asymmetry. However, this requires the acquiring firm to generate an informational advantage and will also require a greater time commitment on average to complete the deal.
Originality/value – While prior literature has demonstrated that the distance between target and acquirer can affect acquisition returns and time to deal completion, this study adds to the literature by demonstrating that the geographic location of the target firm relative to major financial hubs can have a unique effect on mergers and acquisitions as well.

Keywords Acquisition, Merger, Information asymmetry

Paper type Research paper

1. Introduction

Distance and geographic location affect the perceived value of a firm by attenuating information flows regarding the firm's prospects. Loughran and Schultz (2005) show that rural stocks have less investor familiarity, less analyst coverage, and lower liquidity than urban firms. Additionally, O'Brien and Tan (2015) find that firm location relative to analysts influences the speed of coverage initiation. Reduced analyst following and slower coverage initiations place rural firms in a relative information vacuum. The increased information asymmetry and slower information flow can make accurate valuation problematic, forcing rural firms to act to reduce information asymmetry. For instance, John *et al.* (2011) document that rural firms pay higher dividends to compensate for increased costs of investor oversight and to mitigate agency conflicts.

Increased information asymmetry potentially magnifies the relative gains and losses when a firm undertakes a large investment decision. Generally, acquisitions represent the largest investment decisions pursued by firms – consolidating supply chains (vertical integration),

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growing market share, or improving efficiency. However, literature shows that acquiring a firm negatively affects the acquirer's returns (Moeller *et al.*, 2005). Yet, firms engage in acquisitions motivated by both managerial and long-term incentives[1]. Executives can benefit from undertaking acquisitions through increased compensation tied to managerial skill in navigating the acquisition process and increases in firm size (Harford and Li, 2007; Grinstein and Hribar, 2004). The firm can benefit through the synergies and long-run performance increases generated for the acquirer (Devos *et al.*, 2009). Quantifying the synergies and performance increases at the time of deal completion is difficult for shareholders as it requires the incorporation of soft information not easily accessed.

While both management and the firm can benefit from an acquisition, markets tend to react negatively to the announcement of a merger or acquisition (Dong *et al.*, 2006; Betton *et al.*, 2008, 2009). Aktas *et al.* (2009) suggests that the decline in cumulative abnormal return (CAR) stems from managerial learning that allows CEOs to select better targets and bid more aggressively. Aktas *et al.* (2011) provide empirical tests for the managerial learning hypothesis finding that serial acquirers adjust future bids in response to market reactions to the past bid. Gorton *et al.* (2009) suggest that executives use mergers to entrench and make unprofitable defensive acquisitions. In each case, the market reaction stems from the hard information (information easily quantified) incorporated by the market and limited understanding or knowledge of managerial decisions based on soft information (information unable to be converted into a numeric score)[2].

We contend that areas of financial sophistication enable the easier transference of soft information between acquirers and targets. However, the ease of soft information transference allows for more parties to be privy to a large amount of common knowledge. Cai *et al.* (2016) find that firms located in urban locations have a higher takeover exposure and are more likely to receive a takeover bid or become acquired. Acquisitions involving urban targets should include more informed bidders and more negative market reactions.

In contrast, we contend that rural firms suffer greater difficulty in conveying soft information. The increased opacity translates to fewer takeover bids and acquisitions as observed in Cai *et al.*, 2016. In pursuing rural targets, the acquirer is more likely to have acquired soft information and decreased information asymmetry regarding the target, while other potential bidders remain uninformed. The presence of the informed bidder drives away uninformed bidders (Hendricks and Porter, 1988). Thus, acquisitions involving rural targets should include fewer uninformed bidders and relatively more positive market reaction than urban acquisitions.

Using a sample of mergers and acquisitions from 1986 to 2014, this study examines how the proximity to a large financial center impacts the market reaction to a deal announcement and the time to completion. Prior literature has shown that information asymmetry can affect valuation and returns. For example, information asymmetry induces greater underpricing during rural firm initial public offerings (Nielsson and Wojcik, 2016)[3]. Similarly, high information asymmetry results in higher announcement returns to acquisitions of private companies (see e.g. Moeller *et al.*, 2007) and high volatility public firms (Officer *et al.*, 2009). Therefore, acquisitions of rural companies, with greater information asymmetry, are expected to result in higher acquirer abnormal returns than those of urban firms. The results show that acquisitions of firms outside of large financial centers generate higher CARs for the deal announcements than do firms in close proximity to large financial centers. While markets react more favorably to the announcements, rural targets require more time for deal completion than do urban firms. Both findings are consistent with higher information asymmetry around rural firms impacting the acquisitions.

2. Literature review and hypothesis development

Whether an acquisition allows for the firm to increase efficiency, acquire additional resources, or grow market share, each event should have a positive effect on future cash flows.

However, market reactions to acquisitions generally show negative returns to acquirers, suggesting that the acquisitions are value destructive events for the acquirer's shareholders; though this result may be driven by small number of large loss deals in the 1990s (Jensen and Ruback, 1983; Moeller *et al.*, 2005).

In acquisitions, bidding firms tend to suffer from the winner's curse and target firms tend to reap the benefits – the bidder overvalues the target. Shleifer and Vishny (2003) suggest that firms benefit when they are able to exchange their overvalued stock in an acquisition for a target firm. However, Jensen (2005) suggests that overvaluation of equities can lead managers to make value destroying acquisitions. The inflated currency of an overvalued firm incentivizes managers to make convenient acquisitions. Fu *et al.* (2013) show that overvalued acquirers overpay for targets and do not see synergy gains post-acquisition. However, Aktas *et al.* (2009) hypothesize that CEO learning moderates overpayment and value destruction for serial acquirers. As CEOs learn through serial acquisitions, both target selection and valuation improve. Atkas *et al.* (2011) demonstrates an inverse relationship between market reaction and subsequent acquisitions – as CARs decrease (increase) subsequent bids increase (decrease).

For both value increasing and value destructive events, the information environment drives the pricing of each deal. Information flow and asymmetries affect the number of informed traders and potential bidders. Proximity to investors and financial centers has been documented in the literature as a proxy for bias and information flow. Coval and Moskowitz (1999) show that mutual funds tend to invest in firms headquartered in close proximity to the fund location. Additionally, proximity affects corporate financing decisions from the degree to which IPOs are underpriced (Nielsson and Wojcik, 2016) to the level of payout by a firm (John *et al.*, 2011). In both, the proximity to a financial center affects wealth captured by investors. Thus, proximity affects information flow and market reactions.

We contend that proximity of the target or acquirer to large financial centers affects the market reaction to acquisition announcement. When rurally located, firms tend to have lower visibility for analysts (Loughran and Schultz, 2005; O'Brien and Tan, 2015). Lower visibility reduces analyst following and does little to reduce information asymmetry, ceteris paribus. Alternatively, high analyst following lowers information asymmetry, reduces the information advantage of informed bidders, and fails to discourage uniformed bidders. In the presence of large information asymmetry (rural firms), informed bidders can leverage superior information to discourage uninformed bidders (Dionne *et al.*, 2015). The information asymmetry difference based on location should affect the market reaction to deal announcement. We examine informational advantages from the perspective of bidders and targets based on location. Thus, we hypothesize:

H1a. Rural acquirers ought to have higher announcement returns than those of urban acquirers.

H1b. Acquiring rural targets should produce higher announcement returns than returns when acquiring urban targets.

Information asymmetry affects both the bidder side and the target side of the acquisition. The value of the deal to each party hinges on an appropriate valuation of the assets involved in the transaction. From the acquirer's perspective, the accuracy in valuing the target mitigates a potential winner's curse. From the target's perspective, accurate values for the acquirer's stock determines if the target firm's shareholders receive fair value in the event that the deal involves some amount of stock.

Increased time to deal completion may reduce information asymmetry post-announcement and allow a layer of protection against valuation errors for bidders and targets (Houston and Ryngaert, 1997). Bick *et al.* (2017) find that firms with increased information asymmetry (small firms farther away from the acquiring firm) have greater

time to deal completion. The lower analyst visibility for rural firms (Loughran and Schultz, 2005; O'Brien and Tan, 2015) coupled with the rural firms paying to compensate for increased investor oversight costs (John *et al.*, 2011) suggests a different information environment for rural firms vs urban firms. Increased information asymmetry from reduced information flow about rural firms suggests they should have increased time to deal completion. Thus, we hypothesize:

H2a. Rural acquirers ought to experience longer time to deal completion than those of urban acquirers.

H2b. Rural targets ought to experience longer time to deal completion than those of urban targets.

3. Data

The mergers and acquisitions for the data set utilized are collected from Thomson Financial SDC. The data set is constructed from the set of all the US mergers and acquisitions occurring from 1986 to 2014 where both the acquirers and targets are publicly traded. Consistent with prior research, acquisitions are required to have an acquisition value of at least $10 million with the acquirer seeking a 100 percent ownership stake in order to be kept in the data set (Eckbo *et al.*, 1990; Fuller *et al.*, 2002; Bouwman *et al.*, 2009).

As discussed in previous sections, the main variable of interest measures the geographical proximity of both the target and the acquiring firms to the top financial centers. Similar to Nielsson and Wojcik (2016), firms are classified as urban if they are located within 100 miles of one of the counties ranked within the top ten for financial employment and rural if not located within 100 miles of a county ranked within the top 50 for financial employment. Following Nielsson and Wojcik (2016) deal with a target or an acquirer classified as urban or rural are retained, while deals where neither firm is rural or urban are excluded from the sample.

Data for employment in the field of finance are gathered from the US Census Bureau's County Business Patterns. The County Business Patterns data set provides total employment by year for all counties in the USA broken down by business sector. Similar to Nielsson and Wojcik (2016), this study ranks the top ten financial centers based on the number of employees in NAICS sector 523 which includes financial professions most likely to represent a high level of financial expertise[4].

Following a wide range of previous studies (e.g. Coval and Moskowitz, 2001; Nielsson and Wojcik, 2016; Bick *et al.*, 2017), the zip code of the company's headquarter represents the company's location. To calculate the distance from the company to the closest top ten financial centers, the zip code for the county seat is the geographic location of the financial center. The distance is then calculated as the direct line distance between the company's headquarter zip code and the zip code for the nearest financial center.

While Nielsson and Wojcik (2016) use the census data from 2005 to define fixed locations as top financial centers for their whole sample period, financial centers may change over time. Therefore, this study uses a time-series of the top financial centers across all years in the sample. Table I shows the top ten for two unique years (1990 and 2000). We show that while the counties that represent the top financial centers remain somewhat stable, there are shifts. Over the ten year period, three of the top ten counties changed.

Table II provides summary statistics for the firms in the sample. The final data set consists of 2,821 acquiring firms and 2,115 target firms. The discrepancy in the number of acquiring and target firms comes from the fact that targets or acquirers not classifying as either urban or rural are excluded from the sample. However, exclusion of a target's acquirer, or of an acquirer's target, does not result in exclusion of the deal itself.

Interestingly, the percentage of companies classified as rural is nearly identical for both acquiring firms (21.84 percent) and target firms (20.19 percent).

Table III presents the breakdown of observations by year. The largest concentration of merger and acquisition activity in the data set occurs during the period 1994-2001, as would likely be expected due to the concentration of activity during the Dot-Com bubble period. Table IV provides the frequency of observations by Fama-French 12 industry classification. The largest concentration is in finance (classification 11) and business equipment – computers, software, and electronic equipment (classification 6).

4. Results

4.1 Announcement returns

As a first level examination of the impact of proximity to financial hubs on the merger and acquisition process, difference-in-means tests are conducted on the variables of interest (announcement returns and time to deal completion) as well as a host of control variables. The difference-in-means tests are conducted independently for acquiring firms and target firms to identify how proximity to a financial hub (urban/rural) impacts the firms on each side of the deal.

Panel A of Table V examines the differences between urban and rural acquiring firms. Although both firms experience, on average, negative announcement returns (consistent with prior literature that shows that acquiring firms experience negative announcement returns), firms located within 100 miles of a major financial center experience returns that are significantly more negative. While acquisitions in which the acquiring firm is located more than 100 miles from any of the top 50 financial centers experience a negative CAR of

1990	2000
Los Angeles County, CA	*Maricopa County, AZ*
Orange County, CA	Los Angeles County, CA
San Diego County, CA	San Diego County, CA
San Francisco County, CA	*Fairfield County, CT*
Cook County, IL	Cook County, IL
Suffolk County, MA	Suffolk County, MA
Hennepin County, MN	Hennepin County, MN
New York County, NY	*Hudson County, NJ*
Dallas County, TX	New York County, NY
Harris County, TX	Harris County, TX

Table I.
Shifts in largest ten financial centers over time

Variable	*n*	Mean	SD	Minimum	Maximum
AcRuralFlag	2,821	0.2184	0.4132	0	1.0000
AcquirerDist	2,821	3.1866	1.5328	0	7.7824
TRuralFlag	2,115	0.2019	0.4015	0	1.0000
TargetDist	2,115	3.3258	1.4330	0	7.7824

Notes: *AcRuralFlag* (*TRuralFlag*) $=1$ if the acquirer (target) is located greater than 100 miles from the largest 50 financial counties in the year the deal is announced. *AcRuralFlag* (*TRuralFlag*) $=0$ if the acquirer (target) is located within 100 miles from the largest 10 financial centers in the year the deal is announced. *AcquirerDist* (*TargetDist*) is the log(1+distance) from the acquirer (target) to the largest 50 financial counties in the year the deal is announced when the *AcRuralFlag* (*TRuralFlag*) $=1$. *AcquirerDist* (*TargetDist*) is the log(1+distance) from the acquirer (target) to the largest 10 financial counties in the year the deal is announced when the *AcRuralFlag* (*TRuralFlag*) $=0$

Table II.
Summary statistics

Year	Frequency	Percent	Cumulative frequency	Cumulative percent
1986	55	1.95	55	1.95
1987	60	2.13	115	4.08
1988	57	2.02	172	6.10
1989	52	1.84	224	7.94
1990	34	1.21	258	9.15
1991	44	1.56	302	10.71
1992	29	1.03	331	11.73
1993	47	1.67	378	13.40
1994	123	4.36	501	17.76
1995	150	5.32	651	23.08
1996	158	5.60	809	28.68
1997	215	7.62	1,024	36.30
1998	229	8.12	1,253	44.42
1999	212	7.52	1,465	51.93
2000	183	6.49	1,648	58.42
2001	151	5.35	1,799	63.77
2002	85	3.01	1,884	66.78
2003	120	4.25	2,004	71.04
2004	103	3.65	2,107	74.69
2005	104	3.69	2,211	78.38
2006	96	3.40	2,307	81.78
2007	91	3.23	2,398	85.01
2008	70	2.48	2,468	87.49
2009	64	2.27	2,532	89.76
2010	67	2.38	2,599	92.13
2011	37	1.31	2,636	93.44
2012	57	2.02	2,693	95.46
2013	64	2.27	2,757	97.73
2014	64	2.27	2,821	100.00

Table III.
Observations by year

Fama-French 12 industry	Industry	Frequency	Percent	Cumulative frequency	Cumulative Percent
1	Consumer Nondurables – food, tobacco, textiles, apparel, leather, toys	99	3.51	99	99
2	Consumer durables – cars, TVs, furniture, household appliances	35	1.24	134	35
3	Manufacturing – machinery, trucks, planes, off furn, paper, com printing	221	7.83	355	221
4	Oil, gas, and coal extraction and products	111	3.93	466	111
5	Chemicals and allied products	42	1.49	508	42
6	Business equipment – computers, software, and electronic equipment	627	22.23	1,135	627
7	Telephone and television transmission	114	4.04	1,249	114
8	Utilities	78	2.76	1,327	78
9	Wholesale, retail, and some services (laundries, repair shops)	153	5.42	1,480	153
10	Healthcare, Medical equipment, and drugs	318	11.27	1,798	318
11	Finance	806	28.57	2,604	806
12	Other – mines, constr, BldMt, trans, hotels, bus serv, entertainment	217	7.69	2,821	217

Table IV.
Observations by Fama-French 12 industry

Variable	Urban	Rural	Difference	Significance
Panel A: acquirer – urban vs rural				
Dependent variable				
AcquirerDist	2.624	5.202	−2.579	***
Variables of interest				
CAR3	−0.012	−0.005	−0.007	**
DaysToComplete	135.039	158.963	−23.924	***
Control variables				
AcSize	7.628	7.851	−0.223	***
AcMarketLeverage	1.701	2.855	−1.154	***
AcMB	2.213	1.548	0.665	***
TSize	5.487	6.003	−0.516	***
TMarketLeverage	2.231	4.486	−2.255	***
TMB	1.945	1.420	0.524	***
Toehold	0.177	0.049	0.129	***
HiTechTFlag	0.075	0.055	0.020	*
CashOnlyFlag	0.303	0.222	0.081	***
FriendlyFlag	0.977	0.972	0.005	
Competition	0.050	0.044	0.006	
DivFF12Flag	0.211	0.166	0.045	***
MatchAdvFlag	0.005	0.005	0.000	
Panel B: target – urban vs rural				
Dependent variable				
TargetDist	2.836	5.262	−2.426	***
Variables of interest				
CAR3	−0.012	0.003	−0.016	***
DaysToComplete	136.546	158.799	−22.253	***
Control variables				
AcSize	7.633	7.677	−0.043	
AcMarketLeverage	1.879	2.727	−0.848	***
AcMB	2.192	1.556	0.636	***
TSize	5.567	5.769	−0.203	**
TMarketLeverage	2.516	4.396	−1.880	***
TMB	1.936	1.425	0.511	***
Toehold	0.166	0.068	0.098	***
HiTechTFlag	0.070	0.073	−0.002	
CashOnlyFlag	0.289	0.251	0.038	
FriendlyFlag	0.979	0.974	0.004	
Competition	0.049	0.033	0.016	
DivFF12Flag	0.202	0.157	0.045	**
MatchAdvFlag	0.005	0.005	0.001	

Notes: Panel A provides the summary statistics for acquirers and compares the differences between firms located in urban and rural areas. Panel B provides the summary statistics and compares the differences between firms located in urban and rural areas. *CAR3* is the cumulative abnormal return for the three days (−1, 1) surrounding the announcement of the acquisition. *DaysToComplete* is the number of days from the announcement of the acquisition until the acquisition is completed. *AcSize* is the natural log of the market value of equity of the acquirer at the time of the acquisition announcement. *AcMarketLeverage* is the acquirer's total liability divided by its market value of equity. *AcMB* is the market-to-book ratio of the acquirer. *TSize* is the natural log of the market value of equity of the target firm at the time of the acquisition announcement. *TMarketLeverage* is the target's total liability divided by its market value of equity. *TMB* is the market-to-book ratio of the target. *Toehold* is an indicator noting if the acquirer owns greater than five percent of the target firm prior to the acquisition announcement. *HiTechTFlag* is an indicator denoting if the acquisition target is considered a high-tech firm. *CashOnlyFlag* is an indicator noting that the currency of the acquisition deal is only cash. *FriendlyFlag* is an indicator variable noting the attitude of the acquisition, as given in the SDC database. *Competition* is an indicator variable noting that there is more than one bidder for the target. *DivFF12Flag* is an indicator variable noting that the acquirer and target are from different Fama-French 12 industries. *MatchAdvFlag* is an indicator variable noting the acquirer and the target has the same advisor in their top three advisors in the deal. *,**,***Significant at the 10, 5 and 1 percent levels, respectively

Table V.
Summary statistics of variables of interest

only 50 basis points, the negative CAR increases to 120 basis points for firms located near (within 100 miles) one of the ten largest financial centers. Panel B shows that the result is similar for the target firms. Acquisitions of urban target firms are also associated with losses of approximately of 120 basis points, while acquisitions of rural target firms experience a positive abnormal return of 30 basis points. The difference-in-means test indicates that shareholders respond less positively to acquisitions in which the acquiring firm and/or the target firm are located near a major financial center (urban). And, more importantly, shareholders do not view the acquisition of rural firms to be a negative event. Alternatively, the loss of 160 basis points when acquiring an urban firm over a rural firm translates into a loss of approximately $240 million in market value given that the average size of a bidding firm is $15.0 billion.

To examine the effect of each geographic combination of targets and acquirers, we categorize deals by location and present the data in Table VI. Panel A shows the CARs of each pair, while Panel B tests the difference in mean returns for each combination. We find that the market responds most negatively to acquisitions involving targets and acquirers located in urban MSAs. If either target and/or acquirer is rurally located, the change in announcement return is positive with statistical and economical significance. The market most favorably views acquisitions where the target and acquirer are both rurally located with announcement returns of 80 basis points – an increase of 224 basis points relative to when both are urban.

Table VII shows multivariate regressions examining the effect of proximity to a financial center on the three day announcement return (measured by three-day CAR). We include acquirer and target control variables as presented in Table V, consistent with Bick *et al.* (2017)[5]. Regressions (1) and (2) focus on the effect of distance for acquirer and target independently whereas regression (3) shows the results when both are included. While it appears that shareholders look more favorably when either the acquirer or target (or both) is further away from a major financial center at the univariate level, the effect is only statistically significant for the target in the multivariate framework. Therefore, we have little support for *H1a*; we find no difference in the announcement returns between rural and urban acquirers. Our results support *H1b*; bidders receive higher announcement returns when acquiring rural targets instead of urban targets. The results in regression (3)

Panel A: raw data

		CAR		DaysToCompletion	
AcRuralFlag	*TRuralFlag*	*n*	Mean	*n*	Mean
0	0	1,286	−0.014	1,279	136.218
0	1	167	0.004	166	138.994
1	0	171	−0.003	169	137.450
1	1	199	0.008	198	176.212

Panel B: pairwise comparisons

AcRuralFlag	*TRuralFlag*	*AcRuralFlag*	*TRuralFlag*	CAR	DaysToCompletion
0	0	0	1	−0.0179***	−2.776
0	0	1	0	−0.0113**	−1.232
0	0	1	1	−0.0224***	−39.994***
0	1	1	0	0.0066	1.544
0	1	1	1	−0.0045	−37.218***
1	0	1	1	−0.0111	−38.762***

Notes: Panel A provides summary statistics for each of the four combinations of urban/rural acquirer and target pairs. Panel B provides a comparative analysis of cumulative abnormal returns and days to deal completion between each of the different urban/rural acquirer and target pairs. **,***Significant at 5 and 1 percent levels, respectively

Table VI.
Comparisons of urban and rural pairs

Table VII.
The effect of distance from financial centers on acquirer's cumulative abnormal return in the three trading days around the merger announcement date

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.046*** (0.003)	0.055*** (0.000)	0.048** (0.015)	0.044** (0.030)	0.062*** (0.002)	0.043* (0.089)
AcquirerDist	0.001 (0.214)		0.001 (0.210)	0.002 (0.106)		0.003 (0.117)
TargetDist		0.002** (0.043)	0.002** (0.041)		0.003** (0.025)	0.004** (0.021)
Ac_Size	0.002* (0.068)	0.002** (0.041)	0.002** (0.038)	0.001 (0.249)	0.002 (0.135)	0.002 (0.109)
Ac_MB	−0.004*** (0.005)	−0.004** (0.018)	−0.005*** (0.007)	−0.004** (0.012)	−0.003* (0.057)	−0.004** (0.017)
Ac_Marketleverage	−0.001 (0.220)	−0.001 (0.346)	−0.001 (0.412)	0.006** (0.035)	0.004 (0.139)	0.006* (0.052)
T_Size	−0.004*** (0.000)	−0.005*** (0.000)	−0.004*** (0.002)	−0.004*** (0.002)	−0.006*** (0.000)	−0.005*** (0.002)
T_MB	−0.002 (0.248)	−0.003* (0.079)	−0.002 (0.418)	−0.002 (0.351)	−0.003* (0.085)	−0.002 (0.424)
T_Marketleverage	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.004)	0.003*** (0.001)	0.002*** (0.008)	0.002** (0.016)
T_HiTechFlag	−0.002 (0.614)	−0.007 (0.137)	−0.005 (0.351)	−0.002 (0.688)	−0.007 (0.200)	−0.005 (0.433)
DivFF12Flag	−0.001 (0.785)	0.002 (0.622)	0.001 (0.792)	−0.002 (0.686)	0.002 (0.616)	0.000 (0.971)
ToeholdFlag	0.010** (0.048)	0.013*** (0.009)	0.017*** (0.005)	0.002 (0.711)	0.007 (0.245)	0.012 (0.135)
CashOnlyFlag	0.021*** (0.000)	0.019*** (0.000)	0.019*** (0.000)	0.026*** (0.000)	0.023*** (0.000)	0.023*** (0.000)
FriendlyFlag	−0.005 (0.520)	−0.014 (0.115)	−0.015 (0.164)	−0.007 (0.463)	−0.015 (0.119)	−0.017 (0.174)
CompetitionFlag	−0.005 (0.527)	−0.003 (0.655)	−0.006 (0.545)	−0.009 (0.301)	−0.008 (0.396)	−0.010 (0.388)
MatchAdvFlag	0.022 (0.165)	0.021 (0.370)	0.035* (0.054)	0.011 (0.587)	0.011 (0.753)	0.033 (0.139)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,821	2,801	2,115	1,937	1,889	1,416
R^2	0.081	0.087	0.089	0.108	0.107	0.123

Notes: The dependent variable is the three day CAR around a deal announcement date. *AcquirerDist* (*TargetDist*) is the log (1+distance) from the acquirer (target) to the largest 50 financial counties in the year the deal is announced when the acquirer (target) is in a rural location. *AcquirerDist* (*TargetDist*) is the log (1+distance) from the acquirer (target) to the largest 10 financial counties in the year the deal is announced when the acquirer (target) is in an urban location. *,**,***Significant at 10, 5 and 1 percent levels, respectively

may indicate that shareholders feel more comfortable that synergies will be realized when the acquiring firm has an informational advantage. The rural firm has greater information asymmetry (John *et al.*, 2011) requiring the acquiring firm to become a more informed investor than the market prior to the deal announcement. Information asymmetry around a rural target makes a greater portion of the market uninformed investors. Dionne *et al.* (2015) suggest that uninformed investors, aware of their information deficit, will choose to be less aggressive during an acquisition. The inactivity or lower participation of uniformed investors coupled with more accurate valuations pre-acquisition limits the market reaction for the bidder at announcement.

In addition to the main variable of interest, a number of control variables come through as statistically significant. Similar to previous findings (Rapport and Sirower, 1999), deals paid with only cash are viewed favorably by the investors. Announcement returns are also larger on average with the acquiring firm is larger and/or has a lower market-to-book ratio. There is also a positive impact on announcement returns when the target is smaller and/or more levered. Interestingly, it appears that shareholders react positively to deals that are contested, as friendly deals are negatively correlated with announcement returns. Similarly, the variable *Toehold* (which proxies for hostile takeovers according to Betton *et al.*, 2009) is positive and significant. Given that the regulatory environment potentially influences information asymmetry, we remove all financial firms (SIC codes 6000-6999) and utilities (SIC codes 4900-4949) for regressions (4), (5), and (6). When we exclude financials and utilities, we get similar results as those in regressions (1), (2), and (3).

4.2 Time to completion

Turning attention to the variable *DaysToComplete* (which measures the length of time from announcement of the acquisition to completion), Table V shows that rural firms lead to more time-consuming deals. The impact on time to completion is similar for both rural target firms and rural acquiring firms, with both resulting in approximately 22-23 days being added on average to the deal's timeline. However, Table VI illustrates that the increase is driven by acquisitions where both the target and acquirer are rural. In these instances, the time to deal completion increases by over a month. This additional time to completion would be consistent with the idea that acquisition by (or of) a rural firm is likely to slow down the acquisition process due to information asymmetry stemming from limited access to financial analysts and expertise.

While the difference-in-means tests presented in Tables V and VI indicate that acquisitions involving urban firms as either the acquirer or the target are generally received more negatively and proceed more quickly than acquisitions involving rural firms as either the target or acquirer, it is important to analyze these findings in a multivariate regression form. Including a range of control variables previously found in the mergers and acquisition literature to impact the dependent variables helps ensure that the results found in the difference-in-means tests are not driven by other factors correlated with the urban and rural firms.

Table VIII examines the impact of distance from a financial center on the length of time to complete the acquisition in a multivariate regression framework. As in Table VII, regressions (1) and (2) include the distance for the acquirer and the distance for the target independently. When examined independently, additional distance from a major financial center increases the time to deal completion whether the distance is for the target or the acquirer. The increased information asymmetry involving a rural participant may cause both the target and acquirer to be more deliberate in finalizing the acquisition for fear of ex-post information discrepancies. However, regression (3), which includes variables for the distance for both the acquirer and target simultaneously, demonstrates that the target being located in a more rural area (headquartered a greater distance from a major financial center) is the driver of increased time to deal completion. While regression (1) supports *H2a*,

Table VIII.
The effect of distance from financial centers on the length of time to complete deals

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	119.720*** (0.000)	134.286*** (0.000)	98.101*** (0.000)	121.638*** (0.000)	152.749*** (0.000)	112.267*** (0.000)
AcquirerDist	3.006*** (0.006)		2.123 (0.139)	−0.177 (0.889)		−0.729 (0.652)
TargetDist		4.267** (0.015)	5.324*** (0.001)		1.333 (0.562)	3.407** (0.045)
CAR3	23.227 (0.245)	31.949 (0.124)	30.784 (0.188)	7.450 (0.674)	19.150 (0.304)	13.976 (0.495)
Ac_Size	−5.857*** (0.000)	−6.696*** (0.000)	−6.134*** (0.000)	−4.402*** (0.000)	−4.483*** (0.001)	−4.692*** (0.000)
Ac_MB	−0.522 (0.650)	−0.726 (0.604)	0.554 (0.690)	0.426 (0.723)	−0.134 (0.929)	1.356 (0.339)
Ac_Marketleverage	3.731*** (0.001)	2.968** (0.011)	4.056*** (0.002)	6.489* (0.069)	4.689 (0.173)	7.027* (0.076)
T_Size	8.054*** (0.000)	7.725*** (0.000)	8.412*** (0.000)	8.721*** (0.000)	6.264** (0.025)	8.434*** (0.000)
T_MB	−0.166 (0.886)	−0.203 (0.870)	−0.181 (0.890)	−0.090 (0.935)	−0.376 (0.753)	−0.198 (0.871)
T_Marketleverage	1.261* (0.066)	0.657 (0.287)	0.994 (0.188)	0.546 (0.445)	−0.108 (0.839)	0.088 (0.880)
T_HiTechFlag	7.303* (0.088)	2.685 (0.551)	5.185 (0.314)	8.131* (0.059)	3.392 (0.455)	7.122 (0.164)
DiffF12Flag	−9.143** (0.026)	−10.634* (0.052)	−7.207 (0.160)	−3.953 (0.332)	−4.687 (0.430)	−1.718 (0.731)
ToeholdFlag	44.360*** (0.000)	37.229*** (0.000)	46.428*** (0.000)	57.175*** (0.000)	43.972*** (0.000)	58.595*** (0.000)
CashOnlyFlag	−29.808*** (0.000)	−33.653*** (0.000)	−29.336*** (0.000)	−38.010*** (0.000)	−45.052*** (0.000)	−39.481*** (0.000)
FriendlyFlag	−17.466 (0.209)	−16.333 (0.286)	−19.497 (0.256)	−12.748 (0.366)	−20.959 (0.185)	−22.443 (0.202)
CompetitionFlag	25.662** (0.021)	29.362** (0.014)	30.915** (0.028)	23.219** (0.017)	14.828 (0.136)	19.837* (0.092)
MatchAduFlag	89.824 (0.128)	95.120 (0.143)	106.000 (0.135)	30.603 (0.382)	36.240 (0.292)	45.780 (0.252)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,821	2,801	2,115	1,937	1,889	1,416
R^2	0.258	0.194	0.271	0.228	0.124	0.226

Notes: The dependent variable is the number of days to from deal announcement to deal completion; *AcquirerDist* (*TargetDist*) is the log(1+distance) from the acquirer (target) to the largest 50 financial counties in the year the deal is announced when the acquirer (target) is in a rural location. *AcquirerDist* (*TargetDist*) is the log(1+distance) from the acquirer (target) to the largest 10 financial counties in the year the deal is announced when the acquirer (target) is in an urban location. *,**,***Significant at 10, 5 and 1 percent levels, respectively

the inclusion of *TargetDist* in regression (3) results in a lack of significant results. Thus, there is limited support that rural acquirers experience longer times to deal completion than urban acquirers. The results in regressions (2) and (3) support *H2b*; the acquisition of a rural target requires more time to deal completion than urban targets. The increased time to deal completion may be expected as rural target firms, with a more opaque information environment, require more due diligence and will therefore take more time to complete.

Once again, there are a few interesting findings of significance in the control variables. Deals tend to be completed more quickly when the acquirer is smaller and/or the target is larger in size. If the target is more highly levered, the time to completion is increased. Deals that are competitive (more than one bidder) and/or hostile (the variable *Toehold* acts as a proxy as previously stated) tend to take longer to complete. Furthermore, cash only deals complete more quickly than deals that are funded by other means. Cash only deals are attractive to target firms because cash deals holds no valuation risk compared to those paid with acquirer stock. Given that the regulatory environment potentially influences information asymmetry, we remove all financial firms (SIC codes 6000-6999) and utilities (SIC codes 4900-4949) for regressions (4), (5), and (6). When we exclude financials and utilities, we get similar results as those in regressions (1), (2), and (3).

Overall, the findings indicate that proximity to major financial centers impacts the mergers and acquisition process. This result shows a shift in the amount of time necessary for the deal to be completed as firms further from investment banks and other financial expertise tend to move through the process slower. However, the more interesting impact stems from the fact that shareholders view acquisitions differently depending on the proximity of the target firm to financial centers. While acquisitions are viewed negatively on average at announcement, as evident by negative average CARs in the three day window surrounding the announcement, shareholders view the acquisition of rural firms less negatively (with essentially neutral abnormal returns).

4.3 Robustness

To test the robustness of the results, we use alternative specifications for distances to financial centers. The alternative specification replaces the variables *AcquirerDist* and *TargetDist* with dummy variables that equal one if the acquirer is rural (*AcquirerRuralFlag*) or if the target is rural (*TargetRuralFlag*). The results using the alternative specifications as explanatory variables for the announcement returns are shown in Table VIII and are qualitatively unchanged. While the magnitude of the coefficients for the main variables of interest shift due to the nature of changing from continuous to a dummy variable, the direction and significance are similar. One shift of note is that the impact of the acquiring firm being rural becomes statistically significant (and positive) in the combined regression (regression 3). This implies that shareholders respond more positively on average when the acquiring firm is not located near a financial center (Table IX).

Similarly, the regressions on time to deal completion are re-run using the alternate specifications and are shown in Table X. Once again, the results are qualitatively similar. However, time to completion for acquiring a rural firm loses significance in the isolated regression (regression 2), while decreasing from significance at the 99 percent confidence level to the 95% confidence level in the combined regression (regression 3). The takeaway appears to remain the same: time to completion increases for deals involving the acquisition of rural firms.

We conduct additional robustness tests by changing the event study windows utilized for the calculation of abnormal returns. In untabulated results, the event windows (−2, 2) and (−5, 5) were used as alternatives to the (−1, 1) window presented in Table VII. Again, the results were mostly unchanged qualitatively. One change of interest occurs in the five trading day window (−2, 2) as the variable *AcquirerDist* is statistically significant (and positive) at the 95% confidence level. Similar to the finding in Table IX, this implies

	(1)	(2)	(3)
Intercept	0.050*** (0.001)	0.059*** (0.000)	0.057*** (0.002)
AcquirerRuralFlag	0.002 (0.648)		0.007* (0.096)
TargetRuralFlag		0.007** (0.031)	0.006 (0.166)
AcSize	0.002* (0.077)	0.002** (0.041)	0.002** (0.041)
AcMB	−0.004*** (0.004)	−0.004** (0.018)	−0.005*** (0.007)
AcMarketLeverage	−0.001 (0.234)	−0.001 (0.401)	−0.001 (0.499)
TSize	−0.004*** (0.000)	−0.005*** (0.000)	−0.004*** (0.001)
TMB	−0.002 (0.240)	−0.003* (0.083)	−0.001 (0.437)
TMarketLeverage	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.004)
THiTechFlag	−0.002 (0.630)	−0.007 (0.165)	−0.004 (0.441)
DivFF12Flag	−0.001 (0.740)	0.002 (0.653)	0.001 (0.869)
ToeholdFlag	0.010* (0.055)	0.013*** (0.009)	0.017*** (0.006)
CashOnlyFlag	0.021*** (0.000)	0.019*** (0.000)	0.019*** (0.000)
FriendlyFlag	−0.005 (0.499)	−0.013 (0.126)	−0.014 (0.179)
CompetitionFlag	−0.005 (0.535)	−0.003 (0.673)	−0.006 (0.558)
MatchAdvFlag	0.023 (0.165)	0.021 (0.378)	0.035* (0.054)
Year and Industry fixed effects	Yes	Yes	Yes
Number of observations	2,821	2,801	2,115
R^2	0.080	0.087	0.089

Notes: The dependent variable is the three day CAR around a deal announcement date. *AcRuralFlag* and *TRuralFlag* are as defined in Table II. Other variables are as defined in Table V. *,**,***Significant at 10, 5 and 1 percent levels, respectively

Table IX.
The effect of rural acquirer or rural target on acquirer's cumulative abnormal return in the three trading days around the merger announcement date

	(1)	(2)	(3)
Intercept	128.678*** (0.000)	147.674*** (0.000)	122.610*** (0.000)
AcquirerRuralFlag	8.182** (0.033)		3.792 (0.471)
TargetRuralFlag		7.483 (0.159)	9.064 (0.116)
AcSize	24.330 (0.225)	33.621 (0.107)	35.279 (0.134)
AcMB	−5.971*** (0.000)	−6.707*** (0.000)	−6.337*** (0.000)
AcMarketLeverage	−0.492 (0.670)	−0.866 (0.531)	0.321 (0.816)
TSize	3.801*** (0.001)	3.086*** (0.008)	4.248*** (0.001)
TMB	7.891*** (0.000)	7.344*** (0.000)	7.819*** (0.000)
TMarketLeverage	−0.192 (0.868)	−0.215 (0.861)	−0.214 (0.868)
THiTechFlag	1.276* (0.067)	0.708 (0.257)	1.051 (0.174)
DivFF12Flag	7.831* (0.067)	3.383 (0.457)	6.645 (0.196)
ToeholdFlag	−9.558** (0.020)	−11.374** (0.034)	−8.614* (0.095)
CashOnlyFlag	43.753*** (0.000)	36.632*** (0.000)	45.220*** (0.000)
FriendlyFlag	−29.706*** (0.000)	−33.601*** (0.000)	−29.326*** (0.000)
CompetitionFlag	−17.829 (0.200)	−16.013 (0.297)	−19.658 (0.253)
MatchAdvFlag	25.955** (0.019)	29.439** (0.014)	30.859** (0.030)
Year and industry fixed effects	Yes	Yes	Yes
Number of observations	2,821	2,801	2,115
R^2	0.257	0.192	0.264

Notes: The dependent variable is the time to deal completion in days from deal announcement. *AcRuralFlag* and *TRuralFlag* are as defined in Table II. Other variables are as defined in Table V. *,**,***Significant at 10, 5 and 1 percent levels, respectively

Table X.
The effect of rural acquirer or rural target on the length of time to complete deals

that the acquiring firm being rural may lead to shareholders reacting more favorably to the acquisition. Therefore, it would appear that an additional finding (though weaker and more dependent on specification) may be that shareholders view acquisitions made by rural firms more favorably than acquisitions made by urban firms.

To examine whether the higher CARs earned by acquiring rural targets is driven by relative undervaluation we compare the Tobin's Q of rural targets to two different control samples. Given the information disparity between urban and rural firms may drive valuation differences and subsequent market reactions to acquisitions, we compare the Tobin's Q of the targets to control samples. We generate control samples through propensity score matching based on industry (identical SIC code), size, and book to market similar to the matching procedure performed in Bena and Li (2014). We restrict matching firms to those without acquisition activity within the match year or three years prior to the match year. We create two matches for target firms: another firm within their urban/rural group and a firm in the opposite group (rural and urban or urban and rural); we find that across the sample for both matches that the Tobin's Q of the target and its match are statistically identical.

As an additional proxy for undervaluation, we include management quality as defined by Masulis *et al.* (2007) as a control for undervaluation for the regressions previously presented in Tables VI and VII. We find that management quality has no statistically significant explanatory power in the regressions.

5. Conclusion

This study examines the impact of geographic location on both targets and bidders in a merger or acquisition. The geographic location of a firm affects the information available about the firm. Rural firms have a higher degree of information asymmetry than firms located in urban, financially literate locales. The resulting information asymmetry impacts the announcement reaction to bidding firms and the time to deal completion, especially when targets are located far away from a financial center.

Using deals over a 29-year period (1986-2014), results suggest that geographic location impacts market reaction to deal announcement for the bidder and the time to deal completion. Consistent with prior literature, firms located further away from areas of financial expertise (rural firms) have greater information asymmetry. Increased information asymmetry results in increased time to deal completion. However, the additional asymmetry supplies the bidder with an increased informational advantage which the market reacts more favorably than to acquiring urban firms.

The findings presented in this study have implications for both acquiring firms and potential targets firms, as well as the stakeholders of both. For acquiring firms, informational advantage in the form of acquiring a rural firm, where information asymmetry may be greater, can potentially result in better announcement returns. However, there is a cost to this benefit as the acquiring firm will have to generate an informational advantage and be willing to absorb a greater amount of time for the deal to complete. For potential target firms, it is important to understand how geographic location may impact the negotiation process. Similarly, it is important for shareholders to understand the impact of information asymmetry on the acquisition process to fully understand the valuation paid and the potential impact on the value of the acquiring firm's shares.

Information asymmetry as a result of geographic location as it impacts the merger and acquisition process provides an avenue for future research. One potential expansion of this study would be an examination of how management quality, for both the bidder and target, affects the negotiation process given geographic location as proxy for potential information asymmetry. As Cai *et al.* (2016) find that urban targets have a greater likelihood of receiving a bid and completing the deal, an exploration of completed and failed rural acquisitions would prove interesting. Particularly, an analysis of the deals and the factors contributing to success and failure should allow practitioners to seek or invest in potential targets with a greater chance of deal completion.

Notes

1. Williams *et al.* (2008) provide a detailed review of the managerial incentives for mergers and acquisitions and how compensation changes around an acquisition.
2. For a more detailed discussion of hard vs soft information, see Liberti and Petersen (2017).
3. The difference in underpricing is −6.96 percent based on financial professional employment and −6.17 percent based on density of financial professional employment based on age-weighted portfolio sorts. Equally weighted portfolios produced higher levels of underpricing −9.85 and −9.76 percent, respectively.
4. For more detail on the professions included in NAICS sector 523, see the discussion by Nielsson and Wojcik (2016). Specifically, see their discussion in Footnote 3.
5. Due to high correlations between *SomeCashFlag* and *StockOnlyFlag* (−0.854 and significant at the 1 percent level), we use the control variable *CashOnlyFlag* in our regressions and exclude the *SomeCashFlag* and *StockOnlyFlag* control variables. The correlation between the *CashOnlyFlag* and *SomeCashFlag* is 0.545 and significant at the 1 percent level; the correlation between the *CashOnlyFlag* and *StockOnlyFlag* is −0.466 and significant at the 1 percent level.

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