Organizational Identity and First-Mover Advantage

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Abstract

Considerable attention has been paid to whether there is a "first-mover advantage" among organizations. Using data on retail banks over a century, we estimate an ecological model of moving first, and find that first-movers suffer temporarily higher failure rates while they enjoy temporarily higher rates of growth. For organizations that operate in a single market, this risk-return trade off hinges on whether they make strong identity claims. The hazards of failure are especially strong for organizations that name themselves after their local markets, and the benefits in terms of organizational growth also are strong and permanent for such organizations. The results suggest that a sociological understanding of moving first, highlighting the importance of authentic organizational identities, can contribute to our understanding of this strategic issue.

Organizational Identity and First-Mover Advantage

The "first-mover advantage" is among the most widely recognized ideas in the area of business strategy. The press often identifies being first-to-market as a reason for continued success among organizations, an important claim because it implies that the risks involved with moving fast are likely to be worthwhile. Yet the scholarly literature is more circumspect in its treatment of the first-mover advantage. It is not unusual to see academic papers that regard first-mover advantage to be a myth, or at least to be less evident than popular treatments would suggest. And in their thorough reviews of the theory and evidence on the subject, Lieberman and Montgomery (1988, 1998) find that the theoretical conditions for a first-mover advantage are not universal, and that evidence of a first-mover advantage also is limited to certain contexts or other qualifications. The research notwithstanding, the idea of first-mover advantage remains popular in management circles.

One reason for this attention is the usefulness of first-mover advantage as an objective. While being early to market is not a trivial undertaking, it is a clear objective that can serve as a guide to action. So it is that many organizations make it their explicit strategy to deliver products and services to market ahead of their competition. This strategy is especially common among large organizations that routinely move in and out of multiple markets. For such firms, an important decision is when to enter a market, and in making that decision the possibility of first-mover advantage routinely arises (Mitchell, 1989). Product road maps, development gating processes, and strategic plans in large organizations all feature a treatment of the timing problem in market entry. So

conceived, first-mover advantage seems especially relevant to organizations that engage their market positions through an explicit decision process, rather like players in a game.

Yet the organizations we see around us often appear in markets through a much more emergent, less deliberate process. Often an entrepreneur will create an organization at a given time and place simply because that is when and where he is, rather than through a "strategic decision" as such (Selznick, 1957). So the first telephone company in Iowa, the first newspaper publisher in Helsinki, and the first retail bank in Napa all were started by entrepreneurs from those times and places. Each of these first movers built an organization from the relationships and resources each could access in those times and places – so that their new organizations likely could not have been created in some other market nor at some other time in history. We are intrigued by the fact that such first-movers are authentic pioneers – "originals" who embody a market in contrast to the "plays" made by large multi-market organizations that select among the times and places to stage their market entries. Such originality seems likely to have important consequences for organizational identity, and so for the fates of organizations that emerge first in a market.

Here we investigate how such originality shapes the first-mover advantage. We find it noteworthy that authenticity – the subject of so much research attention in contemporary organizational sociology – has received far less consideration in studies of the first mover advantage. We think organizations that are original to a market enjoy authenticity of a sort that the strategic moves of large multi-market firms do not. The "plays" of large multi-market organizations may enjoy first-mover advantages for other reasons, but they are unlikely to plausibly claim the identity of an original pioneer. Of

course, the risks associated with linking one's identity to a single market may also be great. To investigate these ideas empirically, we elaborate an ecological model of the first-mover advantage, and estimate it using data on all retail banks that operated in California over most of the 20th century. By examining each of the hundreds of geographic banking markets in California over such a long time period, we are able to estimate the growth and survival implications of appearing first in a market – and to compare these implications for large multi-location branch systems with those we see among single-location banks that name themselves after their market location.

Originality and First-Mover Advantage

An organization's identity can serve as an important source of advantage – so long as the organization remains consistent with the expectations that go with identity (Hannan et al., 2007). Important audiences make sense out of organizations based on their identities. A key question, then, is whether organizational identities conform to the social categories we use for sense making and classification (Hsu, 2006; Hsu et al., forthcoming). For instance, Zuckerman (1999) found that firms suffer from an "illegitimacy discount" when they operate in combinations of industries that conflict with socially established expectations. At work in such cases is that firms suffer when their actions do not conform to the expectations that we generally associate with their identity. By contrast, organizations that remain true to the expectations associated with their identities benefit by being seen as authentic (Hsu, 2006; Tripsas, 2008).

The importance of identity becomes greatest when an organization's authenticity comes into question. For instance, Carroll and Swaminathan (2000) found evidence of an

illegitimacy discount among so-called contract brewers – organizations that claim to be craft brewers but that in fact contract out to others to brew their beer. Such posers, once outed, generate powerful negative reactions from audiences such as consumers and experts. In fact, Carroll and Swaminathan found that mass producers have been attempting to conceal their affiliation with their craft-brew brands in an attempt to avoid such a backlash. Key here is not that there is a penalty just for failing to conform to an identity, but that the penalty is especially strong for those who make what are found to be false identity claims. As Goffman (1974) notes in his description of "muffing," audiences see even small expectation violations as indicating that much greater falsehood may be at work.

Among the most clearly authentic identity claims is that of the original. By being first in a market, an organization's identity develops alongside that of the market. Stinchcombe (1965: 174) elaborates on this special case, arguing that the first instance of a given form of organization in a given place – if successful – earns for that organization considerable prestige. He reasons that the first organization of its kind in a given place can help to define its own social position in that context, at least if it is successful. First-movers benefit from helping to define the social roles and expectations associated with a given organizational form in a given setting. The resulting prestige, power, and wealth, Stinchcombe argues, are an important source of stratification among organizations favoring successful, pioneering organizations. In this way, the status benefits to successful originals are a special case of the "Matthew effect" – wherein high status actors benefit disproportionately from their prestige (Podolny, 2005; Merton, 1968).

Not all organizations can enjoy the identity of an original, however. In order to be tightly linked to a single market's identity, an organization cannot be all things to all people. Organizations with a "low grade of membership" in a particular market – those that are spread across many other markets too – cannot plausibly make the same legitimate identity claims as can those who are fully specialized to a particular market (Hannan et al., 2007). The specialized first mover in a market was born there "de novo," and so builds an identity in sync with its place of birth (McKendrick et al., 2003). By contrast, the organization that moves in "de alio" from elsewhere – and continues to operate in other markets to boot – is less clearly identified with the market it has entered (Carroll et al., 1996). A similar finding comes from the Sullivan's (1992) analysis of "brand extensions," which benefit from early market entry less than "new name" brands for which no other identity claims have been made. For an original pioneer in a market, birthright and specialization confer the special status of being authentically local.

In this way, originality enhances both an organization's authenticity and its uniqueness – in that the original in any market is uniquely authentic. As Heimer (2001) elaborates using examples at various levels of analysis, the most powerful identity claims are those that qualify one for category membership while at the same time providing biographical contrast to others in the category. Applying this idea to first movers, the pioneering original gains both the legitimacy that goes with category membership and an advantageous contrast as uniquely authentic. Such standing is typically understood through relating biographical accounts that highlight the uniqueness of the subject (Heimer, 2001). In our review of historical archives, we often found such accounts in the records of pioneering retail banks, replete with idiographic stories about the formation

and development of these organizations. Often one will hear claims to a uniquely original biography by those representing organizations, such as "since 1885" or some such early date in promotional materials, as organizations vie for legitimacy in their markets.

In sum, we expect to see an identity-based first-mover advantage among organizations that are born in a market, remain specialized there, and attempt to claim uniqueness by linking the organization's identity to that of the market. Large, complex organizations may spearhead activities in various markets routinely because of their abilities in product development and organization building. And such organizations may enjoy many advantages due to their formidable capabilities. But if there is an identity-based advantage to being first in a market, we expect it to be enjoyed by those who are authentic – who were born, raised, and remain in the market with which they are identified.

Modeling the First-Mover Advantage

The reader may have noticed that we refer to organizations having a first-mover advantage, but only "if successful." In fact, the problem of survivorship bias has long plagued the empirical research on the first-mover advantage (Lieberman and Montgomery, 1998). The typical study in this area, in fact, looks at data on large organizations that have survived the start up process – sometimes not even defining an organization to be eligible for first-mover status until it has survived and grown (e.g. Robinson and Fornell, 1985). As observed in many reviews of this literature, such as Frank Scherer's critique of the Robinson and Fornell (1985) study, it is difficult to

understand whether in fact moving first is an advantage if one ignores the failure risks that are likely to be involved.

Rather than define away the risk of failure, our approach is to model the implications of appearing first in a market using data on all organizations that have existed in an organizational population – regardless of how small or young. We then treat both the downside risk of failure and the upside of organizational growth as processes that are likely to be affected by being first in a market. Furthermore, we allow the effects of being first to change over time, since the implications of being a first-mover vary with time and with the stage of organizational development (Romanelli, 1985; Tufano, 1989). Specifically, we model failure in terms of the instantaneous hazard rate of market exit:

$$r_j(t) = r_j(t)^*\exp[a_r F + b_r t_F],$$

where $r_j(t)$ is organization j's rate of market exit as a function of its duration in the market, $r_j(t)^*$ is the baseline market exit rate, F is an indicator set equal to 1 for organizations that are first to enter their market, and t_F is a time-in-market clock specified only for first-movers. If there is an increased risk of market exit suffered by first-movers, then we would expect to find $a_r>0$, evidence that first movers are more likely to exit a market, and if $b_r<0$ then this risk dissipates over time. Meanwhile, chose to specify the model as a Cox (proportionate hazards) model, allowing us to include control variables, period effects, and market-specific nuisances within $r_j(t)^*$. (These nuisances behave much like market-specific fixed effects.)

With the risks involved in moving first so modeled, we then estimate the growth implications of entering first using the model:

$$S_{jt1} = S_{jt0}^{\alpha} \exp[a_g F + b_g t_F + cX]\varepsilon,$$

where S_j refers to organization j's size at a given time t, X is a vector of control variables (including period effects and market-specific fixed effects) and c are their effects, and F and t_F are the first-mover indicator and clock. If there is a first-mover advantage in organizational growth, then we would expect to find $a_g>0$, and if that effect dissipates with time we should find $b_g<0$.

We further refine these specifications to allow for separate effects for multi-location branch bank systems and to see the implications of identity claims among the single location banks, many of which name themselves after their location. By comparing coefficient estimates across these subsamples of our data, we are able to determine whether the effects of being a first mover depend on whether banks make identity claims.

Data and Method

Our data include every retail bank that ever existed in California between 1900 and 1990. Information was collected by manually coding the life histories of every domestic California bank from the Rand McNally Banker's Directory and Thomson Bank Directory. The full history of population evolution and branching in California banking industry is well documented by the two sources. The existence of each bank was documented in each year. Also recorded were its size in assets and the localities in which it operated. For individual branches, it was also noted when a bank entered or exited a particular locality.

To account for heterogeneity among different locations, we also collected the human population for each city as long as it had a bank. The final dataset consists of 32,657 observations at the bank level, and 105,022 observations at the bank-location dyad level. Figure 1 shows exhibits the number of banks over time, according to whether they operated in only one or in multiple locations. While the overall population reflects a typical pattern of industry life-cycle with initial fast growth followed by gradual decline, increasing branching occurred over most of the 20th century.

We identified the specific geographic location of all 1,625 banking markets in California, and then identified each local banking market entry and exit, as shown in Figure 2. Each market exit was treated as a market exit event for purposes of model estimation. (Of course, for single-location banks, a market entry is an organizational founding, and an exit is a failure.) Non-failure market exit events, such as mergers and acquisitions not due to failure, were treated as a competing risk. For multi-location banks exiting simultaneously from many markets at once, such events were treated as over-sampling on a single event and weighted accordingly (see below). The analyzable data, are described in tables 1, 3, 5, and 7, and include several independent variables:

Number of Locations. In this research, location is defined at city level. One critical issue in localized competition is to attract as much customers as an organization's capacity permits. Such capacity is extremely constrained by where the physical unit is located in banking industry. The number of geographic locations is both a convenient and meaningful indicator to capture how broadly a bank attempts to leverage the financial resources. We also use a binary variable to indicate whether the focal bank is a multi-location organization in our estimates.

Size. Within each banking market, the data measure each bank's size in terms of the number of branches operated by the bank in that location in each year. This measure of size is used in the growth models. As an independent variable in the market exit models, we control for organization-level size in terms of assets. The recorded assets were adjusted to the Consumer Price Index (CPI) published by the United States Bureau of Labor Statistics. We interpolate missing values between any two pints of available information. For those missing outside the range of the existing observations, we impose a match with the closest available value in the time series.

Age. We calculate bank age as the difference between the calendar year and the founding year of a bank. Bank age is distinct from duration in market, which is location specific and is used for purposes of constructing the risk set.

First Mover. We define first mover as the first bank that starts an operating establishment in the history of a city. Each particular location has at most one first mover, and no other organizations will be treated as first mover even if the initial one fails. By construction, a multi-location organization could be first mover in multiple locations. It deserves mentioning that if two or more organizations show up simultaneously in the earliest history of a location, neither is treated as a first mover to avoid false positive errors. Such cases account for less than 3% of the observations.

Number of Competing Organizations. To address the local competition effect for the focal bank, we include the number of competing organizations at each location each year. This variable is distinct from the number of separate establishments operated by rivals, since each rival may operate multiple establishments in a given local market.

The models were specified as proportional hazards and estimated using partial-likelihood techniques (Cox models). To allow for unobserved location-specific heterogeneity, the models were specified with location-specific nuisances. To analyze the exit rates of these banks from the local markets, the data were structured into bank-location dyads, and then these dyads were split into annual segments for the duration of time that a given bank spent in a given locality. The hazard of exit was then estimated at the bank-locality level. Because multi-locality banks often simultaneously exited multiple localities in the same year, these events were weighted by 1/k, where k is the number of simultaneous exits that occurred for that bank in that year. Along with the variables of theoretical interest, we included various control variables and period effects for each decade over the century.

Results

The market exit rate model estimates for single-location banks are shown in Table 2, and the growth model estimates for these banks are shown in Table 4. Market exit rate model estimates for multi-location banks are shown in Table 6, and the growth model estimates for these banks are listed in Table 8. For all models, calendar period effect estimates are shown in the 'b' part of the table.

Looking first at the various first-mover effects, an overall pattern across all tables is clear: In general, first movers suffered higher market exit rates which fell over time, but they also enjoyed higher growth rates that also declined over time. Although these effects vary according to whether or not organizations make identity claims that link them to their markets, the overall pattern suggests that studies of the first-mover

advantage should not be ignoring the risks of failure. First movers are more likely to grow, at least for a while, but they also are more likely to fail. So the "advantage" of being a first mover holds only for those organizations that do not fail by virtue of this risky strategy.

Looking only at the single-location bank results in Tables 2 and 4, a comparison of models 3 and 4 shows that in order to detect a significant first-mover hazard, the model must also include a clock that allows this hazard to dissipate over time. Furthermore, model 5 shows that this hazard is felt entirely for banks that name themselves after their locality. Meanwhile, table 4 shows that single-location first movers grow faster – although again this effect dissipates with the passage of time. For banks that name themselves after the locality, however, the growth advantage continues over time. So by making an identity claim linking the organization to the locality, a bank temporarily increases its hazard of failure significantly, but if this strategy works it enjoys a permanently higher growth rate within the market.

By contrast, multi-location branch systems also saw risk and return due to being a first mover in any given locality (as shown in Tables 6 and 8). Their hazard of failure was considerably higher due to moving first, as shown in model 13, but so was their growth rate as shown in model 16. The magnitudes of these effects were very strong – especially the failure effect – perhaps reflecting the fact that for multi-branch systems moving out of a market did not amount to failing outright. In any case, the multi-branch systems did not have the ability to link their identities to that of a given local market, and so they did not suffer the increase in hazard (nor enjoy a more permanent reward) by making such identity claims.

Several other effects across these models are noteworthy. Single-location banks that migrate to another location (but still remain in only one locale) suffered higher failure rates and lower growth rates. This finding is consistent with the predictions of structural inertia theory, since such location changes are "core" changes to an organization (Hannan and Freeman, 1984; Amburgey et al., 1993). Also noteworthy is that the apparent advantages of being a monopoly that appears in models 6 and 7 vanishes once the first-mover effects are included in the models. This suggests that evidence of monopolist advantages in the growth process was spurious, reflecting a first-mover advantage that had not been properly specified in those models.

Regarding competitive effects, we estimated (but do not show) quadratic specifications of the density of competing organizations in each specific local market. This specification revealed strictly competitive density effects (positive first order density effects). The effects of the squared density terms were negative, and over the observed range acted only to attenuate what remained a competitive effect. So since local density had a strictly competitive effect, and because the quadratic was not useful in the disaggregated density specifications, we build on a baseline model that features density without the squared term. For single-location banks, these models reveal competition among banking organizations within the same locale with respect to both failure and growth – in contrast to the beneficial effect of the number of competing establishments in the locale. Together, these effects suggest that competition came from the number of distinct rival organizations – social density – rather than the material density represented by the number of establishments (which includes many branches of the same rival organizations).

Discussion and Conclusion

When an organization is created, the market conditions at the time arguably play an important role. New organizations typically position themselves with regards to existing organizations, sometimes differentiating from or establishing complementary relations to established players. The relative abundance or scarcity of an organization's initial market context also is likely to have ongoing importance over the life of an organization. Initial conditions also are important when enduring advantages can be gained by being early-to-market. By contrast, some markets favor more recently founded organizations, since these can build up-to-date technologies and strategies into their approach to organizing. These various factors make the initial market conditions at the time of organizational founding important to the long-run viability of organizations. Are organizations more viable in the long run if they are founded in "greenfield" conditions, as one of the initial entrants to a market? Or, alternatively, is viability greater for organizations that enter a market after others have broken new ground, trying and erring much to the benefit of those who come later?

This research question is fundamental to organizational and industry dynamics, and yet the existing literature contains multiple, often contradictory answers to the question. In this paper, we develop an ecological model that allows us to distinguish the significance of being early vs. late to market. In particular, we were able to identify which organizations enjoyed a first mover advantage, taking advantage of a dataset that was designed especially to address this research question – one that contains nearly a century of data on thousands of local banking markets in the U.S. – including markets during the nascent period prior to any organizational foundings. Our results show an

important link between the idea of first-mover advantage in the fields of strategic management and the growing body of work in the area of organizational identity that is blossoming in sociology.

We found that first-movers did generally enjoy an advantage in terms of their growth rate in the local market – at least temporarily. But that advantage is accompanied by a similar increase in the hazard of market exit due to being a first mover. So first movers increase their risks, but also their possible returns, as a result of their early appearance in a market. A key result in this analysis concerned those organizations that linked their identities to the local market. Among single-location banks, naming the organization after the locality dramatically but temporarily increased the chances of failure due to being a first mover. But that strategy also permanently increased the organizations growth rate within the local market. This pattern of effects implies that research on the first-mover advantage needs to take the identity claims of organizations into consideration.

More generally, we think that the strategy literature would do well to draw on a more sociological understanding of market success and failure. The fact that an organization makes an identity claim is of strategic significance, and is likely to shape the consequences of its market actions. To understand the first-mover advantage only in terms of economic market position, to the neglect of the social identities that are so important to organizations, ignores the fact that first movers are originals. Such pioneers take a great risk by virtue of their entry into a market, but if their identity claims prove out over time, they stand also to benefit greatly in terms of status and market position. These sociological forces are key to understanding the risks and returns of being first.

References

Barnett, William P. 2008. *The Red Queen Among Organizations: How Competitiveness Evolves.* Princeton: Princeton University Press.

Barnett, William P. and John Freeman. 2001. "Too Much of a Good Thing: Product Proliferation and Organizational Failure." *Organization Science,* 12: 539-558.

Carroll, Glenn R. 1985. "Concentration and Specialization: Dynamics of Niche Width in Populations of Organizations." *American Journal of Sociology,* 90: 1262-1283.

Carroll, Glenn R., Lyda Bigelow, Marc-David Seidel, and Lucia Tsai. 1996. "The Fates of De Novo and De Alio Producers in the American Automobile Industry, 1885-1981." *Strategic Management Journal,* 17: 117-138.

Carroll, Glenn R., Stanislav Dobrev, and Anand Swaminathan. 2002. "Organizational processes of resource partitioning," *Research in Organizational Behavior,* 24: 1-40.

Carroll, Glenn R. and Michael T. Hannan. 2000. *The Demography of Corporations and Industries.* Princeton: Princeton University Press.

Carroll, Glenn R. and Anand Swaminathan. 2000. "Why the Microbrewery Movement? Organizational Dynamics of Resource Partitioning in the U.S. Brewing Industry." *American Journal of Sociology,* 106: 715-762.

Goffman, Erving. 1974. *Frame Analysis: An Essay on the Organization of Experience.* New York: Harper and Row.

Gouldner, Alvin W. 1957. "Cosmopolitans and Locals: Toward an Analysis of Latent Social Roles.I" *Administrative Science Quarterly*, 2: 281-306.

Gouldner, Alvin W. 1958. “Cosmopolitans and Locals: Toward an Analysis of Latent Social Roles. II” *Administrative Science Quarterly*, 2: 444-480.

Greve, Henrich R. 2002. “An Ecological Theory of Spatial Evolution: Local Density Dependence in Tokyo Banking, 1894-1936.” *Social Forces,* 80: 847-879.

Hannan, Michael T. and Glenn R. Carroll. 1992. *Dynamics of Organizational Populations: Density, Legitimacy, and Competition.* New York: Oxford University Press.

Hannan, Michael T. and John Freeman. 1977. “The Population Ecology of Organizations.” *American Journal of Sociology,* 82: 929-964.

Hannan, Michael T. and John Freeman. 1989. *Organizational Ecology.* Cambridge, MA: Harvard University Press.

Hannan, Michael T., László Pólos, and Glenn R. Carroll. 2007. *Logics of Organization Theory: Audiences, Codes, and Ecologies.* Princeton: Princeton University Press.

Heimer, Carol. 2001. “Cases and Biographies: An Essay on Routinization and the Nature of Comparison.” *Annual Review of Sociology,* 27: 47-76.

Hsu, Greta. 2006. “Jacks of all trades and masters of none: Audiences’ reactions to spanning genres in feature film production.” *Administrative Science Quarterly* 51:420-450.

Hsu, Greta, Michael T. Hannan and Özgecan Koçak. forthcoming. “Multiple category memberships in markets: A formal theory and two empirical tests,” *American Sociological Review*.

Ingram, Paul and Joel A. C. Baum. 1997. “Chain Affiliation and the Failure of Manhattan Hotels, 1898-1980.” *Administrative Science Quarterly*, 42: 68-102.

Lieberman, Marvin B. and David B. Montgomery. 1988. “First-Mover Advantages.” *Strategic Management Journal,* 9: 41-58.

Lieberman, Marvin B. and David B. Montgomery. 1998. “First-Mover (Dis)Advantages: Retrospective and Link with the Resource-Based View.” *Strategic Management Journal*, Vol. 19: 1111-1125.

McKendrick, DavidG., Jonathan Jaffee, Glenn R. Carroll, and Olga M. Khessina. 2003. In the bud ? disk array producers as a (possibly) emergent organizational form. *Administrative Science Quarterly* 48: 60-93.

Merton, Robert K. 1957. “Patterns of Influence: Local and Cosmopolitan Influentials.” Chapter XII in *Social Theory and Social Structure*. New York:Free Press.

Merton, Robert K. 1968. “The Matthew Effect in Science,” *Science,* 159: 56-63.

Mitchell, Will.1989 “Whether and when: Probability and timing of incumbents' entry into emerging industrial subfields.” *Administrative Science Quarterly*, 34: 208-230.

Podolny, Joel M. 2005. *Status Signals: A Sociological Study of Market Competition*. Princeton, NJ: Princeton University Press.

Rand McNally International Bankers Directory. (Annual directories from 1900-1990). Rand McNally, Chicago, IL.

Robinson, William T. and Claes Fornell. 1985. “Sources of Market Pioneer Advantages in Consumer Goods Industries.” *Journal of Marketing Research,* 22: 305-317.

Romanelli, Elaine. 1989. “Environments and Strategies of Organization Start Ups: Effects on Early Survival.” *Administrative Science Quarterly,* 34: 369-387.

Selznick, Philip. 1957. *Leadership in Administration: A Sociological Interpretation.* New York: Harper and Row.

Simmel, George. 1922 (tr. 1955 by Reinhard Bendix). *The Web of Group-Affiliations.* New York: Free Press.

Sorenson, Olav. 2003. "Social networks and industrial geography." *Journal of Evolutionary Economics*, 13: 513–527

Sorenson, Olav. 2005. "Social Networks and the Persistence of Clusters: Evidence from the Computer Workstation Industry." Pp. 297-316 in Stefano Breschi and Franco Malerba (eds.) *Clusters, Networks and Innovation.* New York: Oxford University Press.

Sorenson, Olav and Audia, Pino G. 2000. "The social structure of entrepreneurial activity: Geographic production of footwear in the United States, 1940–1989." *American Journal of Sociology*, 106: 424–462.

Sorenson, Olav and Toby E. Stuart. 2001. "Syndication networks and the spatial distribution of venture capital investments." *American Journal of Sociology*, 106: 1546–1588.

Stinchcombe, Arthur L. 1965. "Social Structure and Organizations." Pp. 142-193 in James G. March (ed.) *Handbook of Organizations*. Chicago: Rand-McNally.

Stuart, Toby E. and Olav Sorenson. 2003. "The geography of opportunity: Spatial heterogeneity in founding rates and the performance of biotechnology firms'. *Research Policy*, 32: 229–253.

Sullivan, Mary T. 1992. "Brand Extensions: When to Use Them." *Management Science,* 38: 793-806.

Thomson Bank Directory. (Annual directories from 1991-1993). Thomson Financial Publishing, Skokie, IL.

Tripsas, Mary. 2008. “Technology, Identity, and Inertia through the Lens of ‘The Digital Photography Company’”. *Organization Science,* forthcoming.

Tufano, Peter. 1989. “Financial Innovations and First-Mover Advantages.” *Journal of Financial Economics,* 25: 213-240.

U.S. Department of Commerce. 1988. *County and City Data Book.* U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, Washington, DC.

U.S. Department of Commerce. 1992. *USA County Statistics* [CD-ROM database]. U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census, Washington, DC.

Zuckerman, Ezra W. 1999. “The Categorical Imperative: Securities Analysts and the Illegitimacy Discount.” *American Journal of Sociology* 104: 1398-1438.

Figure 1: Numbers of Single-Location and Multi-Location Banks in California

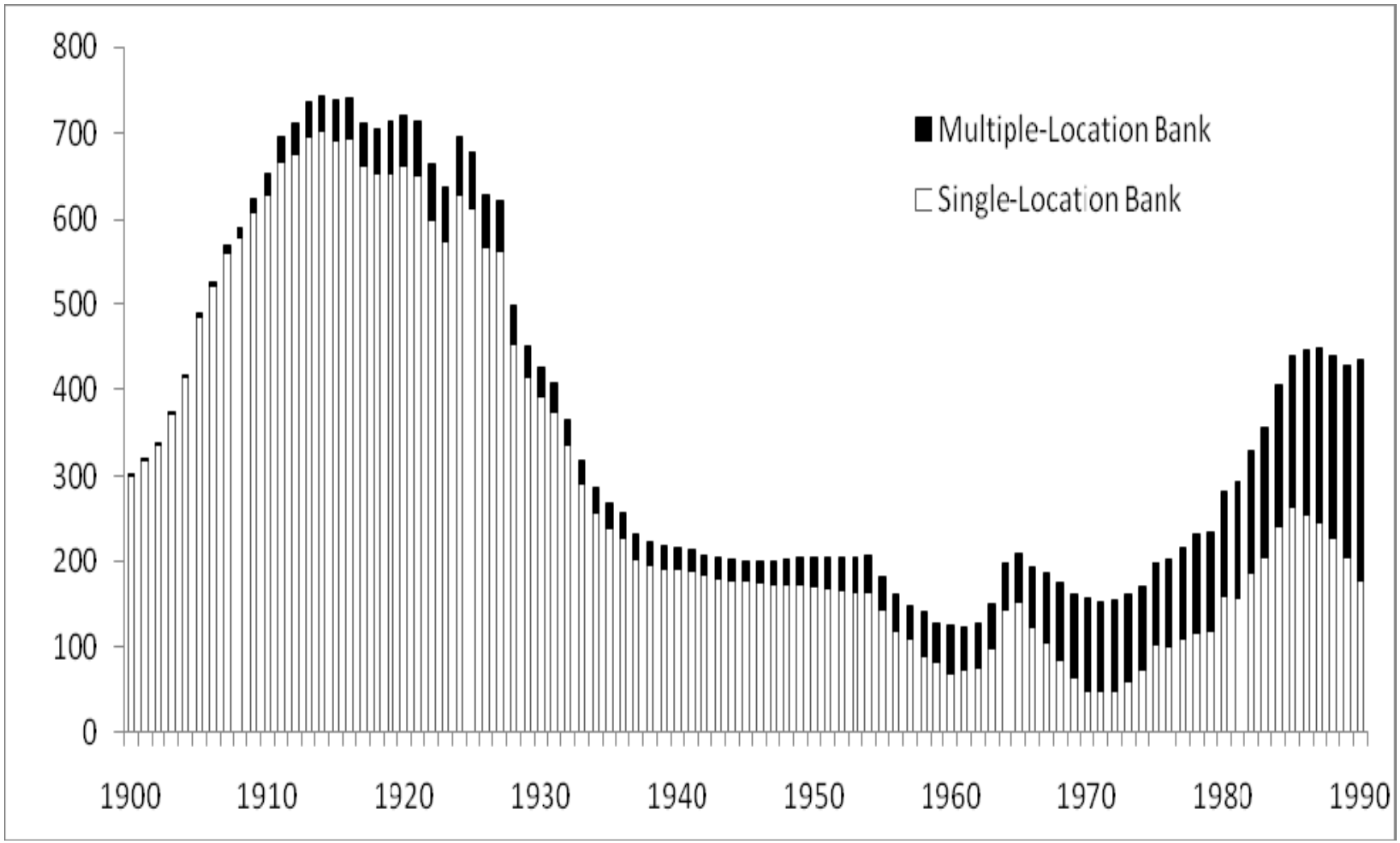

Figure 2: Number of Location Entries and Exits Among California Banks

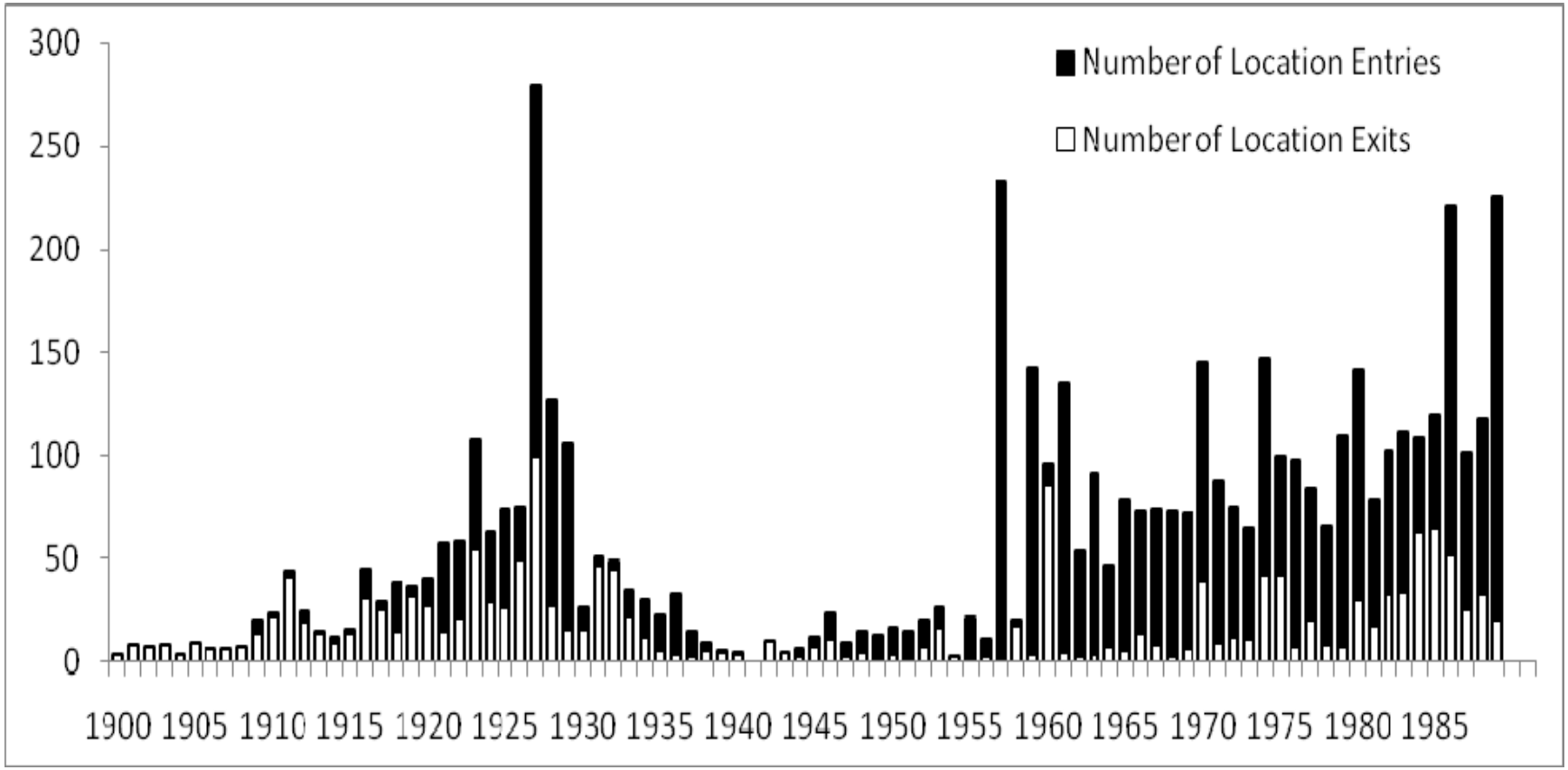

Table 1
Description of the Data used to Estimate the Market Exit Rate for Single-Market Banks in California, 1900-1993†

	Minimum	Maximum	Mean	Std. Dev.
ln(Local Market Population)	4.605	15.009	9.096	2.262
ln(Bank's Assets)	5.851	22.462	15.734	1.629
Statewide Bank Density	102	742	491.572	206.093
# of Rival Bank Branches	0	338	17.238	50.692
in Local Market				
# of Rival Banks	0	76	6.034	10.602
in Local Market				
Monopoly	0	1	0.202	0.402
Migrant	0	1	0.007	0.082
Bank Named After Locality	0	1	0.389	0.488
First Mover	0	1	0.329	0.470
First Mover for Bank	0	1	0.164	0.371
Named After Locality				
First Mover for Bank Not	0	1	0.165	0.371
Named After Locality				
First Mover Duration	0	113	7.316	14.708

†"Market" refers to a geographically local banking market. The data include 622 market exits among 1,897 banks across 502 markets over 25,349 weighted organization-years.

Table 2a
Cox Models of the Market Exit Rate for Single-Market Banks in California, 1900-1993†

	Model 1	Model 2	Model 3	Model 4	Model 5
ln(Local Market Population)	.5324**	.5341**	.5701**	.5863**	.5929**
	(.1370)	(.1372)	(.1396)	(.1407)	(.1411)
ln(Bank's Assets)	-.3205**	-.3203**	-.3223**	-.3245**	-.3238**
	(.0384)	(.0384)	(.0385)	(.0385)	(.0386)
Statewide Bank Density	.0041**	.0041**	.0041**	.0041**	.0041**
	(.0008)	(.0008)	(.0008)	(.0008)	(.0008)
# of Rival Bank Branches	-.0078**	-.0079**	-.0080**	-.0081**	-.0081**
in Local Market	(.0018)	(.0018)	(.0018)	(.0018)	(.0018)
# of Rival Banks	.0307**	.0311**	.0317**	.0329**	.0331**
in Local Market	(.0126)	(.0127)	(.0127)	(.0127)	(.0127)
Monopoly	-.7738**	-.7913**	-.9860**	-1.0342**	-1.0821**
	(.3589)	(.3642)	(.3827)	(.3831)	(.3856)
Migrant	1.7126**	1.7074**	1.7059**	1.7144**	1.6817**
	(.3885)	(.3890)	(.3911)	(.3918)	(.3950)
Bank Named After Locality				.2957**	.1643
				(.1234)	(.1436)
First Mover		.0517	.5440*	.5259*	
		(.1771)	(.3046)	(.3068)	
First Mover for Bank					.8244**
Named After Locality					(.3467)
First Mover for Bank Not					.1872
Named After Locality					(.3609)
First Mover Duration			-.0232**	-.0251**	-.0247**
			(.0117)	(.0118)	(.0119)
Log Likelihood	-758.1925	-758.15	-756.1634	-753.315	-751.5759

*p<.10, **p<.05

†"Market" refers to a geographically local banking market. The data include 622 market exits among 1,897 banks across 502 markets over 25,349 organization-years. Note that each model also includes calendar period effects, which are reported in Table 2b, and is estimated with market-specific nuisances.

Table 2b
Calendar Period Effects Associated with the Models in Table 2a

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
1910<year≤1920	.1738	.1857	.1557	.1398	.1748
	(.2505)	(.2539)	(.2535)	(.2539)	(.2548)
1920<year≤1930	.3537	.3743	.3726	.3656	.4068
	(.2467)	(.2568)	(.2560)	(.2572)	(.2580)
1930<year≤1940	1.8357**	1.8656**	1.8314**	1.8122**	1.8058**
	(.2867)	(.3046)	(.3056)	(.3061)	(.3067)
1940<year≤1950	-.0105	.0270	-.1276	-.1810	-.1756
	(.6711)	(.6828)	(.6956)	(.6962)	(.6947)
1950<year≤1960	1.9868**	2.0141**	1.9165**	1.8518**	1.8288**
	(.4822)	(.4907)	(.4962)	(.4979)	(.4993)
1960<year≤1970	1.8455**	1.8714**	1.7956**	1.7380**	1.7230**
	(.4844)	(.4924)	(.4955)	(.4956)	(.4976)
1970<year≤1980	.8670	.8883	.8165	.7973	.7533
	(.5408)	(.5456)	(.5499)	(.5494)	(.5535)
1980<year≤1990	-.5787	-.5569	-.6295	-.6841	-.7167
	(.5193)	(.5247)	(.5284)	(.5276)	(.5328)

*p<.10, **p<.05

Table 3
Description of the Data Used to Estimate Models of Within-Market Branch Proliferation for Single-Market Banks in California, 1900-1993†

	Minimum	Maximum	Mean	Std. Dev.
ln(Bank's Branches in Market)	0	4.043	0.029	0.175
ln(Local Market Population)	4.605	15.009	9.077	2.256
Statewide Bank Density	102	742	492.490	206.766
ln(Bank's Assets)	5.851	22.462	15.736	1.621
Duration at Current Location	0.500	112	16.518	16.240
# of Rival Bank Branches	0	338	17.049	50.507
in Local Market				
# of Rival Banks	0	74	5.962	10.479
in Local Market				
Monopoly	0	1	0.205	0.404
Migrant	0	1	0.006	0.076
First Mover	0	1	0.332	0.471
First Mover Duration	0	113	7.345	14.715
Bank Named After Locality	0	1	0.389	0.488
First Mover for Bank	0	1	0.166	0.372
Named After Locality				
First Mover for Bank Not	0	1	0.166	0.372
Named After Locality				

†"Market" refers to a geographically local banking market. The data include 25,285 organization-year panels including 1,897 organizations in any of 502 local markets.

Table 4a
Models of Within-Market Branch Proliferation for Single-Market Banks in California, 1900-1993†

	Model 6	Model 7	Model 8	Model 9	Model 10
ln(Bank's Branches in Market)	.9722**	.9721**	.9717**	.9710**	.9707**
	(.0081)	(.0081)	(.0081)	(.0083)	(.0084)
ln(Local Market Population)	.0019	.0019	.0019	.0019	.0019
	(.0013)	(.0013)	(.0013)	(.0013)	(.0013)
Statewide Bank Density	-.000005	-.000005	-.000005	-.000004	-.000004
	(.000007)	(.000007)	(.000007)	(.000007)	(.000007)
ln(Bank's Assets)	.0016**	.0016**	.0016**	.0016**	.0015**
	(.0006)	(.0006)	(.0006)	(.0006)	(.0006)
Duration at Current Location	.00002	.00004	.00008	.00008	.00008
	(.00007)	(.00008)	(.00009)	(.0001)	(.0001)
# of Rival Bank Branches	.00002	.00003	.00002	.00002	.00002
in Local Market	(.00003)	(.00003)	(.00003)	(.00003)	(.00003)
# of Rival Banks	-.0005**	-.0005**	-.0005**	-.0005**	-.0005**
in Local Market	(.0001)	(.0001)	(.0001)	(.0001)	(.0001)
Monopoly	.0029**	.0034**	.0021	.0019	.0022
	(.0014)	(.0016)	(.0013)	(.0014)	(.0013)
Migrant	-.0152**	-.0153**	-.0154**	-.0150**	-.0148**
	(.0069)	(.0069)	(.0068)	(.0068)	(.0068)
First Mover		-.0010	.0029**	.0026**	
		(.0015)	(.0013)	(.0013)	
First Mover Duration			-.00016**	-.00017**	-.00016*
			(.000079)	(.000078)	(.000081)
Bank Named After Locality				.0042**	.0055**
				(.0017)	(.0023)
First Mover for Bank					-.0006
Named After Locality					(.0023)
First Mover for Bank Not					.0048**
Named After Locality					(.0017)
Constant	-.0384**	-.0377**	-.0389**	-.0394**	-.0394**
	(.0136)	(.0132)	(.0132)	(.0133)	(.0133)
F	3263.328	3238.302	3286.743	3143.724	3381.163
Log Likelihood	32492.49	32492.71	32495.49	32502.8	32504.79

*p<.10, **p<.05

†"Market" refers to a geographically local banking market. The data include 25,285 organization-year panels including 1,897 organizations in any of 502 local markets. Note that each model also includes calendar period effects, which are reported in Table 4b, and is estimated with market-specific fixed effects.

Table 4b
Calendar Period Effects Associated with the Models in Table 4a

	Model 6	**Model 7**	**Model 8**	**Model 9**	**Model 10**
(1910<year≤1920)	.0030*	.0029	.0030*	.0030*	.0029*
	(.0017)	(.0018)	(.0017)	(.0017)	(.0017)
(1920<year≤1930)	.0053**	.0051**	.0055**	.0056**	.0054**
	(.0024)	(.0024)	(.0024)	(.0024)	(.0024)
(1930<year≤1940)	-.0024	-.0028	-.0023	-.0022	-.0023
	(.0020)	(.0020)	(.0020)	(.0020)	(.0020)
(1940<year≤1950)	-.0033	-.0037	-.0031	-.0030	-.0032
	(.0023)	(.0026)	(.0025)	(.0025)	(.0025)
(1950<year≤1960)	-.0007	-.0012	-.0006	-.0005	-.0007
	(.0031)	(.0034)	(.0033)	(.0034)	(.0034)
(1960<year≤1970)	.0040	.0036	.0045	.0044	.0040
	(.0040)	(.0040)	(.0042)	(.0042)	(.0042)
(1970<year≤1980)	.0115	.0112	.0121	.0124*	.0123*
	(.0072)	(.0071)	(.0074)	(.0073)	(.0073)
(1980<year≤1990)	.0257**	.0255**	.0263**	.0264**	.0264**
	(.0056)	(.0056)	(.0057)	(.0057)	(.0057)

*p<.10, **p<.05

Table 5
Description of the Data Used to Estimate the Market Exit Rate for Multi-Market Banks in California, 1900-1993†

	Minimum	Maximum	Mean	Std. Dev.
ln(Local Market Population)	4.605	15.009	9.467	2.171
Statewide Bank Density	102	742	274.059	133.811
ln(Bank's Assets)	5.851	25.588	21.824	3.086
Bank Age	0.5	135	51.013	32.214
# of Bank's Local Markets	2	513	191.886	183.661
Statewide				
# of Rival Bank Branches	0	338	13.671	40.232
in Local Market				
# of Rival Banks	0	76	4.942	8.025
in Local Market				
Monopoly	0	1	0.176	0.381
Non-Hometown Location	0	1	0.892	0.311
First Mover	0	1	0.122	0.328
First Mover Duration	0	124	2.233	8.362

†"Market" refers to a geographically local banking market. The data include 858 market exits (324 after weighting) among 515 banks across 769 markets over 64,992 organization-years (47,904 after weighting).

Table 6a
Cox Models of the Market Exit Rate for Multi-Market Banks in California, 1900-1993†

	Model 11	**Model 12**	**Model 13**
ln(Local Market Population)	.3296	.3252	.3100
	(.2097)	(.2091)	(.2076)
Statewide Bank Density	-.0005	-.0006	-.0006
	(.0017)	(.0017)	(.0017)
ln(Bank's Assets)	-.0922**	-.0888**	-.0865**
	(.0392)	(.0393)	(.0395)
Bank Age	.0036	.0029	.0038
	(.0029)	(.0029)	(.0030)
# of Bank's Local Markets	-.0086**	-.0086**	-.0088**
Statewide	(.0014)	(.0014)	(.0015)
# of Rival Bank Branches	-.0023	-.0033	-.0030
in Local Market	(.0057)	(.0058)	(.0058)
# of Rival Banks	-.0038	-.0027	-.0028
in Local Market	(.0197)	(.0196)	(.0197)
Monopoly	-.5013	-.6102	-.7067
	(.4151)	(.4314)	(.4402)
Non-Hometown Location	.2770	.2536	.2114
	(.2538)	(.2546)	(.2549)
First Mover		.4411	1.1119*
		(.4155)	(.5736)
First Mover Duration			-.0741*
			(.0424)
Number of Observations	47904	47904	47904
Log Likelihood	-189.951	-189.3896	-188.0709

*p<.10, **p<.05

†"Market" refers to a geographically local banking market. The data include 858 market exits (324 after weighting) among 515 banks across 769 markets over 64,992 organization-years (47,904 after weighting). Note that each model also includes calendar period effects, which are reported in Table 6b, and is estimated with market-specific nuisances.

Table 6b
Calendar Period Effects Associated with the Models in Table 6a

	Model 11	**Model 12**	**Model 13**
1910<year≤1920	.2848	.3279	.5975
	(1.1511)	(1.1671)	(1.1949)
1920<year≤1930	1.3265	1.5097	1.8295
	(1.0789)	(1.1060)	(1.1426)
1930<year≤1940	.3593	.5802	.8393
	(1.2097)	(1.2466)	(1.2816)
1940<year≤1950	-1.2708	-1.0617	-.8558
	(1.3493)	(1.3834)	(1.4164)
1950<year≤1960	-.0039	.1652	.4167
	(1.3057)	(1.3364)	(1.3717)
1960<year≤1970	-.8944	-.7016	-.4379
	(1.2686)	(1.3029)	(1.3395)
1970<year≤1980	-.8953	-.6838	-.4246
	(1.2402)	(1.2779)	(1.3142)
1980<year≤1990	-1.0325	-.7794	-.5296
	(1.1163)	(1.1608)	(1.1967)

*p<.10, **p<.05

Table 7
Description of the Data Used to Estimate Models of Within-Market Branch Proliferation for Multi-Market Banks in California, 1900-1993†

	Minimum	Maximum	Mean	Std. Dev.
ln(Bank's Branches in Market)	0	4.431	0.223	0.531
ln(Local Market Population)	4.605	15.009	9.446	2.164
Statewide Bank Density	102	742	265.545	130.518
ln(Bank's Assets)	5.851	25.588	21.881	3.082
Bank Age	0.5	135	51.433	32.094
Duration at Current Location	0.5	135	18.349	17.426
# of Bank's Local Markets	2	513	196.794	184.177
Statewide				
# of Rival Bank Branches	0	338	13.331	39.720
in Local Market				
# of Rival Banks	0	74	4.773	7.704
in Local Market				
Monopoly	0	1	0.179	0.384
Non-Hometown Location	0	1	0.894	0.308
First Mover	0	1	0.124	0.329
First Mover Duration	0	123	2.238	8.355

†"Market" refers to a geographically local banking market. The data include 60,777 organization-year panels including 515 organizations across 769 markets.

Table 8a
Models of Within-Market Branch Proliferation for Multi-Market Banks in California, 1900-1993†

	Model 14	**Model 15**	**Model 16**
ln(Bank's Branches in Market)	.9653**	.9653**	.9653**
	(.0022)	(.0022)	(.0022)
ln(Local Market Population)	.0109**	.0108**	.0107**
	(.0018)	(.0018)	(.0018)
Statewide Bank Density	-.00007**	-.00007**	-.00007**
	(.00001)	(.00001)	(.00001)
ln(Bank's Assets)	.0010**	.0011**	.0011**
	(.0005)	(.0005)	(.0005)
Bank Age	.00001	.00001	.00001
	(.00002)	(.00002)	(.00002)
Duration at Current Location	.0002**	.0002**	.0002**
	(.00006)	(.00006)	(.00006)
# of Bank's Local Markets	.00001	.00001	.00001
Statewide	(.00001)	(.00001)	(.00001)
# of Rival Bank Branches	-.0010**	-.0010**	-.0010**
in Local Market	(.0003)	(.0003)	(.0003)
# of Rival Banks	.0014**	.0015**	.0015**
in Local Market	(.0003)	(.0003)	(.0003)
Monopoly	.0007	-.0004	-.0005
	(.0018)	(.0018)	(.0018)
Non-Hometown Location	-.0089**	-.0088**	-.0088**
	(.0026)	(.0026)	(.0026)
First Mover		.0063**	.0073**
		(.0019)	(.0024)
First Mover Duration			-.00005
			(.0001)
Constant	-.0679**	-.0719**	-.0721**
	(.0180)	(.0180)	(.0178)
Number of Observations	60777	60777	60777
F	20681.83	19707.6	19265.74
Log Likelihood	50271.68	50275.99	50276.1

*p<.10, **p<.05

†"Market" refers to a geographically local banking market. The data include 60,777 organization-year panels including 515 organizations across 769 markets. Note that each model also includes calendar period effects, which are reported in Table 8b, and is estimated with market-specific fixed effects.

Table 8b
Calendar Period Effects Associated with the Models in Table 8a

	Model 14	**Model 15**	**Model 16**
(1910<year≤1920)	.0208**	.0219**	.0222**
	(.0054)	(.0053)	(.0052)
(1920<year≤1930)	.0100	.0121	.0125
	(.0167)	(.0168)	(.0165)
(1930<year≤1940)	-.0167**	-.0136*	-.0130*
	(.0077)	(.0078)	(.0073)
(1940<year≤1950)	-.0178*	-.0144	-.0139
	(.0093)	(.0094)	(.0090)
(1950<year≤1960)	-.0149*	-.0114	-.0108
	(.0089)	(.0090)	(.0086)
(1960<year≤1970)	-.0141	-.0105	-.0100
	(.0097)	(.0098)	(.0094)
(1970<year≤1980)	-.0172*	-.0134	-.0128
	(.0102)	(.0104)	(.0100)
(1980<year≤1990)	-.0145	-.0103	-.0098
	(.0102)	(.0105)	(.0102)

*p<.10, **p<.05