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Categorical Competition in the Wake of Crisis: Banks vs. Credit Unions

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Abstract. We connect two distinct streams of research on categories to study the role of within-category typicality in the context of legitimacy shocks. We argue that, following a legitimacy shock, member organizations of the tainted, focal category suffer equally, irrespective of their typicality. However, only the typical members of the newly favored, oppositional category benefit. Therefore, the effects of legitimacy shocks are asymmetrically influenced by typicality. We argue this pattern is the result of a two-stage process of categorization by audiences, whereby audiences prioritize distinctions between organizations in a newly favored category and spend limited efforts considering distinctions in the tainted, focal category. We examine our theory in the context of the U.S. financial services industry, where four different kinds of organizations engage in competition: traditional commercial banks, community banks, single-bond credit unions, and multi-bond credit unions. Consistent with our theory, we show that both traditional commercial banks and community banks suffer in terms of deposit market share following the legitimacy shock of the 2007 financial crisis, but the relative gains to credit unions are strongest for single-bond credit unions.

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Keywords: categorical competition • typicality • legitimacy shock • cooperatives • credit unions • financial crisis • banking

Introduction

Researchers are increasingly interested in how categories affect organizations (Negro et al. 2010, Pontikes 2018). One important stream of this work assesses the benefits and costs of typicality within a category. In these studies, typicality is defined as a high grade of membership within a given category and is achieved via compliance with prevailing norms and expected behaviors (Hannan et al. 2007). For example, "muscle cars" are a category of American cars that are equipped with a powerful V-8 engine and designed for racing while remaining "street legal." This category is typified by the Pontiac GTO from the mid-1960s,[1] with other cars in the muscle car category often being described in relation to it (despite the category originating with the 1949 Oldsmobile "Rocket" 88[2]). This stream of research finds that, in a wide range of settings, less typical members of a category—including those that straddle multiple categories—suffer from lower audience appeal and weaker performance (Zuckerman 1999, Hsu 2006, Hsu et al. 2009, Kovács and Hannan 2010, Kim and Jensen 2011, Smith 2011, Pontikes 2012, Negro and Leung 2013, Leung 2014, Leung and Sharkey 2014, Kovács and Hannan 2015, Goldberg et al. 2016).

Whereas the stream of work described above mostly takes the legitimacy of categories as given, a newer and related set of papers focuses on the dynamics of categories and legitimacy changes over time. This new stream of research recognizes that categories may not be fixed (Porac et al. 1995, Rao et al. 2005, Durand and Panolella 2013, Zhao et al. 2017) and that the social approval of categories may rise and fall (Ruef and Patterson 2009, Navis and Glynn 2010, Negro et al. 2010), sometimes because of an exogenous shock (Jonsson et al. 2009, Vergne 2012, Piazza and Jourdan 2018) or because of strategic actions by members of the categories (Hsu and Grodal 2015). Such events often involve a process of "categorical delegitimation" (Greve et al. 2010), whereby wrongdoing by one organization may stigmatize other organizations that are perceived as similar (Devers et al. 2008, Yu et al. 2008, Jonsson et al. 2009, Vergne 2012, Paruchuri and Misangyi 2015, Greve et al. 2016), sometimes including innocent organizations (Zavyalova et al. 2012), and eventually result in a reduction of the legitimacy

of the overall category. Such a legitimacy shock to the category may in turn drive audience members to seek out organizations in other categories, particularly categories that are similar to but distinct from the "shocked" category (Piazza and Jourdan 2018).

We connect these two streams of research on categories in an effort to understand the role of typicality in the context of legitimacy shocks. We ask two questions: For the organizations in the focal category experiencing a legitimacy shock, does typicality exacerbate the negative effects? Next, do the typical organizations in the newly favored, oppositional category[3] derive most of the benefits from disaffected audience members? The answers to these questions are important for both streams of research referenced above. Although research on legitimacy shocks has shown heterogeneous effects on organizations *across* categories (Piazza and Jourdan 2018), an open question is whether legitimacy shocks have heterogeneous effects *within* categories. Moreover, although the research on typicality has documented benefits in stable categories, whether typicality will operate the same way when categories are being challenged is unclear. For example, if typical organizations bear the brunt of legitimacy shocks, typicality may not always be desirable.

We argue that the effects of legitimacy shocks are asymmetrically influenced by typicality: all members of the tainted, focal category suffer equally, irrespective of their typicality; however, only the typical members of the newly favored, oppositional category benefit. We maintain that this pattern is a result of a two-stage process of categorization by audiences (Zuckerman 1999, 2016; Phillips and Zuckerman 2001; Cattani et al. 2017; Zhao et al. 2017). The two-stage process predicts that audiences first choose a preferred category and then make choices within that category based on member attributes such as typicality. Thus, when a legitimacy shock arrives in one category, it triggers some audience members to defect wholesale from the tainted, focal category in the first stage and shift selectively into a new, likely similar category in the second stage. As audiences prioritize distinction more in the new category than they do in the tainted one, they will choose the most typical member of the new category, which is likely to be more familiar, recognizable, and legitimate compared with other offerings.

Empirically, we test our ideas by exploring how the recent global financial crisis affected the market shares of banks and credit unions, from 2004 to 2012. The financial services industry has sets of organizations that occupy different categories (Hannan 2010) but still offer relatively similar products and services. We focus on two of these categories of organizations within the broader financial services industry: credit unions and banks. The mission of credit unions is to create shared value for their constituents (Carroll et al. 1988, Schneiberg 2010, Ashforth and Reingen 2014, Boone and Özcan 2014). Credit unions are organized as cooperatives, a governance structure that, as we explain further below, reinforces their membership in a category distinct from banks (Simons and Ingram 1997, 2003; Ingram and McEvily 2007). Alternatively, banks embody the corporate values of diversification of risk through the pooling of global assets and, thus, constitute a category that is distinct from credit unions (Freeman and Audia 2011). We also distinguish in this context between members of both categories of organizations that are more or less typical based on their grades of membership. As detailed below, we distinguish between single-bond credit unions (more typical) and multibond credit unions (less typical), as well as commercial banks (more typical) and community banks (less typical). The existence of two categories consisting of organizations that offer similar services, and where each has within-category variation with respect to typicality, makes financial services an ideal setting to test our theory.

We show that the financial crisis, which provided an unanticipated shock to social approval of banks among other economic and social effects, delegitimized banks and drove consumers to switch to credit unions. We also study the role of typicality in each category. We find that the negative effect of the financial crisis is similar for commercial banks and community banks, whereas the positive effect is concentrated on single-bond credit unions. Overall, this evidence supports our theory that the effects of legitimacy shocks are asymmetrically influenced by typicality.

Our findings contribute to the categories literature by bringing together two related streams of research and examining how legitimacy shocks may affect different organizations with varying grades of membership within different categories. We propose an additional reason why typicality may be beneficial (Zuckerman 1999, Hsu 2006, Hsu et al. 2009, Kovács and Hannan 2010, Negro and Leung 2013, Leung and Sharkey 2014, Kovács and Hannan 2015), in that typical organizations may disproportionally benefit from shocks to the legitimacy of other categories that drive audiences to their category.

In the next section, we proceed by elaborating on our theoretical arguments and developing our hypotheses. We then apply these ideas to the financial services industry, first providing institutional details about banks and credit unions and then empirically testing our predictions. We conclude with the theoretical and practical implications of our findings.

Theory Development

Legitimacy Shocks and the Two-Stage Model

We are interested in the effect of legitimacy shocks on organizations across and within categories. The fortunes

of organizations depend on the continued approval of society, that is, legitimacy (Dowling and Pfeffer 1975, DiMaggio and Powell 1983). Although legitimacy exhibits some level of inertia and tends to increase as organizations and industries become more established, it can also be challenged (Elsbach 1994, Suchman 1995) and eventually depleted (Sine and David 2003). Shocks to legitimacy can be triggered by sudden and exogenous events such as a surprising revelation of wrongdoing (Jensen 2006, Jonsson et al. 2009, Zavyalova et al. 2012, Vergne 2012, Sharkey 2014, Paruchuri and Misangyi 2015, Piazza and Perretti 2015, McDonnell and Pontikes 2018, Piazza and Jourdan 2018) or by a social movement that quickly gains influence (King 2008, Hiatt et al. 2009, McDonnell and King 2013, Yue et al. 2013, McDonnell and Werner 2016). Although the triggering event may be limited to a single organization or a subset of the organizations,[4] this event will eventually have far-reaching ripple effects on an entire category, through a process of "categorical delegitimation" (Greve et al. 2010) or "categorical confusion" (Fiske and Taylor 2001, Zavyalova et al. 2012), where wrongdoing by one organization may stigmatize other organizations that are perceived as similar (Devers et al. 2008, Yu et al. 2008, Jonsson et al. 2009, Vergne 2012, Zavyalova et al. 2012, Paruchuri and Misangyi 2015, Greve et al. 2016).

Recent scholarship in this literature has sought to explain the movement of constituents across categories as a result of a legitimacy shock affecting a focal category. Piazza and Jourdan (2018) theorize that organizations that provide services similar to the scandal-plagued organization(s), but reside in different categories, will experience gains as disaffected individuals in the audience search for alternatives. These authors test their ideas by exploring how church membership across denominations changed in response to the abuse scandals involving Catholic clergy. They consider flows between Catholic churches and Protestant churches, which are also Christian but are viewed as categorically distinct. They find that Protestant denominations, being the most similar, made significant gains after the Catholic church scandals, by both adding new members and retaining existing ones.

In our paper, we define the oppositional category to be the category that is perceived by the majority of audience members as the "next best" alternative. In some cases, the oppositional category is quite obvious, either because two categories are dominant (e.g., in the case of American politics, Democrats vs. Republicans)[5] or because the audience members have largely homogeneous preferences. In other cases, there may exist many different candidates that could be the oppositional category, each of which is differentiated from the focal category across distinct dimensions. For example, if the focal category is regular beef, then the potential oppositional categories could be chicken, organic beef, or plant-based beef substitute, each of which can be contrasted with the focal category across a different dimension (i.e., red vs. white meat, organic vs. nonorganic food, animal-based or plant-based). When a shock to legitimacy occurs, we expect the oppositional category to be the category that is differentiated from the focal category on the dimension that is most salient at the time, but is similar enough on other dimensions. For example, if the shock highlighted the negative health consequences of red meat, then the oppositional category might be chicken. If the shock was related to chemical use, however, then the oppositional category might be organic beef. Finally, if the shock made environmental issues more salient, then the oppositional category might be a plant-based beef substitute.[6]

This logic can be applied to the empirical context studied by Piazza and Jourdan (2018), where multiple candidate oppositional categories are available, in this case religious denominations for Catholics to consider defecting to after the abuse scandals in the church. The authors find the Protestant denominations were the category most defectors favored, precisely because they enforced stricter norms of conduct—a dimension made salient by the legitimacy shock—but otherwise offered products and services that were most similar to the tainted category.

Although previous work has thus demonstrated that a legitimacy shock will have, on average, a negative effect on all members in the focal category (Jonsson et al. 2009) and, on average, a positive effect on all members in the oppositional category (Piazza and Jourdan 2018), far less is known about whether these effects will be heterogeneous within these categories. This question is important because categories may contain many kinds of organizations, and the literature has emphasized the importance of typicality within category as a major theme (Zuckerman 1999, Hsu 2006, Hsu et al. 2009, Kovács and Hannan 2010, Negro and Leung 2013, Leung and Sharkey 2014, Kovács and Hannan 2015). Our paper offers a theory about how legitimacy shocks will impact organizational-level outcomes differently within categories according to typicality. In particular, we are interested in the following questions: Within the focal category experiencing a legitimacy shock, how, if at all, does typicality moderate the negative effect on organizational-level outcomes? Furthermore, within the newly favored, oppositional category, how, if at all, does typicality moderate the positive effect on organizational-level outcomes?

To answer these questions, we draw on the two-stage model (Zuckerman 1999, 2016; Phillips and Zuckerman 2001), which has been used to analyze

the benefits and costs of typicality in established and stable categories. The two-stage model starts with the candidate-audience interface (e.g., Zuckerman 1999, 2016; Phillips and Zuckerman 2001). In the first stage, the audience makes a choice about which candidates to evaluate. They select candidates by category, because it is more cognitively efficient than reviewing all candidate organizations and because the candidates in the category are considered to be legitimate offerings. In the second stage, the audience selects a distinctive candidate from within the chosen category. The audience prioritizes making distinctions between organizations within their chosen category more so than they do in other categories. To be selected, candidates must conform to the expectations of the chosen category on certain dimensions, but also be differentiated on key attributes.

It is important to recognize that the two-stage model evokes both cognitive and normative assumptions. Specifically, the cognitive basis of the two-stage model lies in the idea of dual modes in social cognition (Brewer 1991, Brewer and Feinstein 1999, Fiske and Taylor 2001), which offers an explanation for when people perceive others in more and less automatic ways. According to this perspective, the evaluator initially identifies an individual using an automatic, category-based process and stops there if the individual is not relevant to their goals. If the individual is perceived as relevant and if the evaluator is sufficiently motivated, then the evaluator makes assessments using available attributes of the individual. Further, it also means that not only will evaluators assess candidates cognitively, but they will also be motivated by normative concerns. The evaluators will be concerned by how other evaluators see them, based on which individuals they assess and the nature of the assessment (Phillips and Zuckerman 2001). In other words, the actors are assumed to be subject to both egocentric and altercentric uncertainty (Podolny 2001).

Asymmetric Effect of Typicality Under Legitimacy Shocks

Applying the two-stage model to our setting, our analysis begins when a legitimacy shock arrives in one category, triggering some audience members to defect from the tainted, focal category. What pattern does this defection take? Audience members in the focal category have to pick what the oppositional category is and whether they will defect to the oppositional category.

Given the process outlined by the two-stage model (Zuckerman 1999, 2016; Phillips and Zuckerman 2001), we expect the defecting audience members will pay limited attention to the distinction between organizations in the tainted, focal category, because it requires less cognitive energy to rule out all organizations in that category. In addition, as discussed above, the defecting audience members may also pay limited attention to the differences between candidates in the tainted category because they fear normative judgement of other audience members. Assuming that other audience members spend equally little efforts on making distinctions between candidates in the tainted category, choosing to switch to a candidate within the tainted category may expose the defecting member to negative judgment from other members who will not distinguish between the new and old choice. Thus, little or no shifting occurs from one organization to another within the tainted, focal category, but instead a shift takes place completely out of the tainted, focal category. In other words, grades of membership do not moderate the decision to leave the tainted category. If a moderating effect existed, audience members would abandon "more typical" organizations at a higher rate than "less typical" organizations, because those "more typical" organizations embody the category. Note that the idea that audience members spend relatively little effort differentiating among different organizations in the tainted category is consistent with the prediction in the literature on "categorical delegitimation" (Greve et al. 2010) as well as the literature on "categorical confusion" (Fiske and Taylor 2001, Zavyalova et al. 2012), already discussed above.

In the second stage, the audience will carefully distinguish between organizations within the newly favored, oppositional category. In making the distinction between organizations within the newly favored, oppositional category, one distinctive organizational attribute is typicality, which the literature has suggested is important (Zuckerman 1999, Hsu 2006, Hsu et al. 2009, Kovács and Hannan 2010, Negro and Leung 2013, Leung and Sharkey 2014, Kovács and Hannan 2015). In addition, typicality is a useful attribute for the audience that is shifting away from the tainted, focal category, because this audience is unlikely to be familiar with other distinctive dimensions of the newly favored, oppositional category. Furthermore, given that this audience is moving because of legitimacy concerns about the tainted, focal category, legitimacy per se is important.[7] In addition, as a newcomer to the new category, the switching member may be especially sensitive to the judgement of other audience members within that category and may therefore be motivated to choose the most legitimate organization in that category for normative reasons.

In sum, we argue that to reduce cognitive load and establish their own legitimacy among audience members in the new category, audience members prioritize making distinctions between organizations within the newly favored, oppositional category (according to typicality) and will spend limited efforts considering distinctions in the tainted, focal category. As a result, the gains from

typicality during legitimacy shocks are asymmetric, because as a category becomes increasingly preferred, the more typical members gain more than the less typical members. As a category becomes less preferred overall, all members suffer equally irrespective of typicality. To summarize our theory, we propose that the effects of legitimacy shocks are asymmetrically influenced by typicality. Specifically, we have the following.

Proposition. *Following a legitimacy shock* (1) *member organizations of the tainted, focal category suffer equally, irrespective of their typicality;* (2) *only the typical members of the newly favored, oppositional category benefit.*

Context: The Financial Services Industry

We test our theoretical propositions in the financial services industry. We study two categories of firms within the industry: banks and credit unions. We have a setting where the oppositional category is fairly clear, which is ideally suited for an inquiry on within-category dynamics, rather than choices between alternative categories (Piazza and Jourdan 2018). As mentioned above, banks are for-profit financial institutions that are associated with a broad customer base, whereas credit unions are cooperative financial institutions that are associated with a narrow customer base. These attributes relate directly to their respective business models. Credit unions succeed on the basis of mutual assurance and monitoring. Banks prosper on their ability to attract a diverse mix of assets and manage risk.

Organizations within these categories that deviate from these categorical norms will be seen as less typical and will have low grades of membership. Within banks, we can distinguish between large, global banks and community banks. Large banks have increasingly dominated the banking landscape. As reported by the Council of Economic Advisers (CEA; 2016), the share of loans held by big banks (which CEA defines as those with assets greater than $10 billion) increased from about 50% in 1994 to about 80% in 2015, and growth in the number of bank branch offices during this time was almost entirely driven by big banks. Thus, by the start of the financial crisis, the prototypical bank was a big bank with lots of assets and many bank branches that allowed it to service many different customers. More importantly, the size and diversity of big banks was consistent with the logic of banks as a category, giving them a high grade of membership. By contrast, community banks are more likely to be regionally focused and are often much smaller than global banks, with their advantage deriving from intimate knowledge of their customers, which enables relational lending. Community banks that serve a narrow customer base are now seen as less typical of banks and, thus, have a lower grade of membership.

Credit unions first appeared in the United States in the early part of the 20th century (Moody and Fite 1984) and became increasingly popular between 1935, when 1% of the U.S. population belonged to one, and 1996, when over 11,000 credit unions were in operation, serving 34% of the adult population (Hannan 2003). In contrast to banks, credit unions generally offer their services to members only. Historically, this restriction meant individuals could only become credit-union members if they shared a common bond with other members, for example, through employment, neighborhood, or faith-based organizations (Barron et al. 1994, p. 392). In focusing their efforts on members, credit unions are choosing to build stronger relationships with a relatively narrow set of homogeneous customers, rather than trying to maximize their customer base. What distinguishes credit unions from banks is thus that they make a different trade-off between the strength of their relationships vis-à-vis the size of their customer base; in population ecology terms, credit unions can be thought of as organizations that pursue a narrower niche (Freeman and Hannan 1983, Dobrev et al. 2002).

Not all credit unions are the same, however. Single-bond credit unions continue to have a relatively narrow and well-defined set of customers, following the tradition that embodied the early credit-union movement in the United States (Bergengren 1952, Burger and Dacin 1992). However, recent changes in regulation[8] have allowed credit unions to accept many different types of members, leading to the rise of multibond credit unions. These credit unions have more diffuse networks of members, which leads to less cohesion. Lower levels of network cohesiveness likely lead to lower typicality, because the heterogeneity of networks will reduce expertise, equality, and consensus, the three key characteristics of "collegiality" in Weberian terms (Weber 1978, Waters 1989). As noted by other scholars, cohesive networks among members is what typifies credit unions, but "as group heterogeneity increases, these bases for cooperatives dissolve" (Schneiberg et al. 2008, p. 641). For these reasons, we posit that single-bond credit unions typify this category. By contrast, multibond credit unions, which serve a broad customer base, are seen as less typical of credit unions.

The financial crisis constitutes an unanticipated shock to social approval that may influence market outcomes for these various sets of organizations. The financial crisis that began in late 2007 (hereafter referred to as "the financial crisis" or "the crisis") was a pivotal event in modern economic history and trigged a significant economic downturn. It was also an episode during which commercial banks were severely challenged, as the flight to liquidity dramatically affected many banks' balance sheets (Freixas et al. 2011). Indeed, "silent" bank runs were reported at the start of

the crisis, as famously noted by Nouriel Roubini,[9] and as later modeled formally by Gertler and Kiyotaki (2015). In the search for culprits for the financial crisis, the world's leading banks, many of them headquartered in the United States, were appealing targets. Public trust in America's financial system decreased markedly during and following the crisis (Greve and Kim 2014, Guiso et al. 2013), and politicians, consumer groups, and even other business people began condemning banks and questioning their outsized role in the global economy. Importantly, this negative public sentiment was not limited to specific banks playing an outsized role in subprime mortgage and bad loans in general, but pertained to the bank category more generally, including small banks that had far lower exposure to bad loans (Gallup 2012).

The trigger for the financial crisis came disproportionally from "one end of the spectrum," namely, large commercial banks, which were the organizations most involved in subprime mortgages. Data indicate that although all types of banks and credit unions had exposure to bad loans (whether subprime mortgages, auto loans, or other types), the large banks generally had the most exposure. For example, data compiled by the Institute for Local Self Reliance from the Federal Deposit Insurance Corporation (FDIC) and National Credit Union Administration (NCUA) suggest the proportion of bad loans held by large banks was around 3%, whereas the proportion of bad loans held by both community banks and credit unions was about 1.25%. Although large banks played an outsized role in subprime mortgages, public perception of banks following the crisis was generally negative, regardless of bank size. For example, the Confidence in Institutions poll (Gallup 2012) indicated a general decline in confidence in banking institutions following the crisis, relative to the precrisis period. Thus, the legitimacy shock resulting from the financial banks affected all banks even though, as discussed above, community banks were not as involved in bad loans as large banks and were no different from credit unions in this regard.

The negative spillover toward community banks is thus an example of an audience generalizing from one member of a category to all members of that category (Jonsson et al. 2009). Such generalization is consistent with the two-stage model and our theoretical propositions: because banks are the tainted, focal category impacted by the legitimacy shock, we expect community banks (less typical) to be as negatively impacted by legitimacy shocks as global banks (more typical), as people will defect from the category wholesale. At the same time, we expect single-bond credit unions, which typify the newly favored, oppositional category, to experience the greatest benefits from the legitimacy shocks to banks, whereas multibond credit unions, less typical in the credit-union category, will not receive as much benefit, if any. We further posit that single-bond credit unions benefit from "switching," whereby individuals remove their money from banks and place them in credit unions.[10] When our theory, described in the prior section, is applied to this context, we have the following two hypotheses.

Hypothesis 1. *Among banks (tainted focal category), large commercial banks (more typical) will experience the same negative effect of legitimacy shocks on deposits as community banks (less typical).*

Hypothesis 2. *Among credit unions (oppositional category), single-bond credit unions (more typical) will experience stronger positive effects of legitimacy shocks on deposits than multibond credit unions (less typical).*

Data, Variables, and Methods

Organizational-Level Analysis

We collect annual data on commercial banks at the institutional and branch level from the FDIC Summary of Deposits (SOD) database during the period of 2004–2012.[11] We also collect data on credit unions from the NCUA call reports of the second quarters of each year during the period of 2004–2012. The call reports provide data on credit unions' deposits at the organizational level. Because banks are required to submit deposit data to the SOD as of June 30 every year, we are able to combine depository data of commercial banks and credit unions from the same time period in a given year.

We calculate *Commercial banks' deposit amount* by summing up deposits across branches for a given bank in a given year. To distinguish between banks with different grades of membership, we define a dummy variable, *Community banks*, that is coded 1 for banks with less than $1 billion in assets, and 0 otherwise, consistent with the FDIC definition of community banks (FDIC 2012). We use *Credit unions' deposit amount* for a given credit union in a given year from the NCUA. To distinguish between credit unions with different grades of membership, we draw on the NCUA data to determine credit unions' fields of membership and define dummy variables for *Single-bond credit unions*, *Multibond credit unions*, and *Other credit unions*.[12] We calculate *Post crisis* as a dummy variable that equals 1 for all years after 2007 (inclusive), and 0 otherwise.[13]

To test our hypotheses, we run a series of ordinary least squares (OLS) specifications. We start by estimating a regression of *Organization's deposit amount* on *Post crisis*, pooling together the sample of banks and credit unions, to establish a baseline expectation of the impact of the financial crisis on the deposit amount of

an average banking organization, be it banks or credit unions. We then use the sample of commercial banks and run regressions of *Commercial banks' deposit amount* on *Post crisis*, as well as the interaction between *Post crisis* and *Community banks*, with large banks serving as the omitted category. To test Hypothesis 1, we assess if the coefficient of the interaction term between *Post crisis* and *Community banks* is a precise 0. Similarly, we use the sample of credit unions and estimate regressions of *Credit unions' deposit amount* on *Post crisis*, the interaction between *Post crisis* and *Single-bond credit unions*, and the interaction between *Post crisis* and *Multibond credit unions*, with other credit unions serving as the omitted category. Hypothesis 2 predicts a positive and statistically significant coefficient of *Credit unions' deposit amount* on *Post crisis*, as well as a positive and statistically significant coefficient of the interaction between *Post crisis* and *Single-bond credit unions*. It also predicts a statistically significant difference between the size of the coefficient of the first interaction term and the second.

We include a number of control variables in the specifications described above. We control for organizational fixed effects across all models, which deal with the time-invariant organizational characteristics that are correlated with both the postcrisis time period and deposit amounts. We also control for a number of time-variant market-level characteristics, including market-presence measures such as the *Number of branches* to control for the accessibility of each institution and loan-performance measures such as the *Net charge-off ratio* and *Delinquency rate* to control for the financial soundness of the banks and credit unions.[14] We further control for headquarter-level demographic factors including the *Median household income*, *% of government employees*, and *Population*, as well as % of Age above 50. Table 1 reports the descriptive statistics of the main organization-level variables and controls as well as correlations.

Market-Level Analysis

Although the organizational-level analyses are consistent with our theory, they are not a complete test of our theory. Instead, to provide a tighter test of our theory on legitimacy shock and competition, a better research design would be to compare deposit share at the market level before and after the crisis. The reason is that banks and credit unions often serve communities in different markets, and the results from our organizational-level analysis may just reflect the financial crisis affecting these markets differently. Thus, using aggregated organizational-level deposit data may lead to erroneous conclusions about competition in the local markets.

For commercial banks in the market-level analysis, we aggregate the deposit data at the branch level from the SOD database onto the market level. For credit unions, although branch deposit data are not directly available from the NCUA call reports, we make use of the Federal Financial Institutions Examination Council's Home Mortgage Disclosure Act (HMDA) data and disaggregate organizational-level deposit data onto the market level.[15] Specifically, for each multibranch credit union, we disaggregate deposits into the markets where it has branches, proportional to the volume of home loans in that market.[16] We define markets at the metropolitan statistical area (MSA) level[17] and start the panel from 2004, because that year marked a major overhaul of the HMDA reporting regulations.

Next, to study market-level competition between credit unions and commercial banks, we calculate *Credit unions' deposit market share* for a given market and year, which is the share of credit-union deposits as a fraction of total deposits (credit-union deposits plus bank deposits). We also calculate the community banks' and large banks' deposit market share as a fraction of total deposits measured by the credit-union deposits plus bank deposits (of all types). Further, we calculate the single-bond credit unions', multibond credit unions', and other credit unions' deposit market share as a fraction of total deposits measured by the credit-union deposits (of all types) plus bank deposits. The use of market shares to study market-level outcomes is consistent with existing literature in economics and finance (e.g., Feinberg 2001, Fernando et al. 2005, Gonzalez 2009).

Similar to the organizational-level analysis, we first run an OLS specification of *Total deposit* on *Post crisis* to establish a baseline expectation of how the financial crisis impacts the average deposits at the market level. We then run an OLS specification to compare the deposit market shares before and after the financial crisis. We estimate regressions of *Credit unions' deposit market share* on *Post crisis*. We also estimate separate regressions of *Community banks' deposit market share* and *Large banks' deposit market share* on *Post crisis*, and we compare the relative magnitudes of these coefficients to test Hypothesis 1. Hypothesis 1 predicts a negative and statistically significant coefficient of *Community banks' deposit market share* on *Post crisis*, as well as a negative and statistically significant coefficient of *Large banks' deposit market share* on *Post crisis*. Hypothesis 1 also predicts that the difference between the size of the coefficients is a precise 0. Similarly, we estimate separate regressions of *Single-bond credit unions' deposit market share* and *Multibond credit unions' deposit market share* on *Post crisis*, and we compare the relative magnitude of the coefficients to test Hypothesis 2. Hypothesis 2 predicts a positive and statistically significant coefficient of *Single-bond credit unions' deposit market share* on *Post crisis* and a significant difference between the coefficient of

Table 1. Summary Statistics and Correlation Table (Org-Level)

	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) *Org's deposit amount* (in millions)	443.79	9,771.86	1.00							
(2) *Post crisis*	0.64	0.48	0.01	1.00						
(3) *Org net charge-offs* (%)	0.68	39.21	0.00	0.01	1.00					
(4) *Org delinquency* (%)	3.99	28.06	0.00	0.00	0.03	1.00				
(5) *Government employee* (%)	5.40	4.44	0.01	−0.01	0.00	0.01	1.00			
(6) *Median HH income* (in thousands)	52.25	10.80	0.01	0.21	0.00	0.01	−0.13	1.00		
(7) *Number of branches*	6.90	85.52	0.94	0.01	0.00	0.00	0.02	0.00	1.00	
(8) *Population* (in millions)	2.09	2.63	0.00	0.01	0.00	0.02	−0.27	0.39	−0.01	1.00
(9) *Age above 50* (%)	30.63	4.15	−0.01	0.27	0.00	0.00	−0.21	−0.15	−0.01	−0.29

Single-bond credit unions' deposit market share on *Post crisis* and the coefficient of *Multibond credit unions' deposit market share* on *Post crisis*. Note our dependent variable is deposit market share, which by construction is bounded between 0 and 1. We choose to run linear probability models on this variable (Angrist and Pischke 2009)[18] and are able to test the validity of this approach as well as replicate results using alternative specifications, as reported in Online Appendix Table A1.1.

Across these models, we include market fixed effects to control for the time-invariant differences in geographic characteristics, local regulations on cooperatives, as well as demographic factors that influence the choice of financial institutions and vary across states. We also control for market characteristics that vary over time. We control for the *Number of bank branches* and *Number of credit unions with branches* in each market to account for market-structure explanations for competitive outcomes, as well as concerns that any decrease in bank deposits may be due to bank failure. We use loan-performance measures such as the *Net charge-off ratio* and *Delinquency rate*. These controls help us address an alternative explanation that customers choose to bank more with credit unions after the crisis because they think their money will be safer there. Another set of alternative explanations concerns market-level characteristics that correlate with the crisis as well as change in deposit ratios. For example, in areas where peoples' income levels drop because of the financial crisis, these same individuals might also withdraw more deposits from banks. Thus, an income effect could explain lower bank market share after the crisis. To alleviate these concerns, we control for market-level demographic factors including the *Median household income*, *% of government employees*, and *Population*, as well as *% of Age above 50*. We cluster the error terms at the market level. Table 2 reports the descriptive statistics of the main market-level variables and controls as well as correlations.

Results

Organizational-Level Analysis

The results at the organizational level are reported in Table 3. Model 1 uses the pooled sample and runs ordinary least squares (OLS) regressions of organizations' deposit amount on a postcrisis dummy while controlling for organizational fixed effects as well as time-variant headquarter-level controls, as previously specified. It shows that, on average, the deposit amount for an average financial organization is statistically smaller than its level in 2004–2006 ($\beta = -72.7$, $p = 0.022$). Thus, on average, individuals held lower deposits after the crisis, likely because the financial crisis triggered a significant economic downturn and shrank savings.

Models 2 and 3 run OLS regressions of banks' deposit amount on a postcrisis dummy while controlling for the same set of control variables. Model 2 indicates banks' deposit amount, on average, is statistically smaller post crisis ($\beta = -182.5$, $p = 0.045$). Model 3 includes the interaction terms between *Post crisis* and a dummy variable for *Community bank*, with large banks as the omitted category. Results suggest the postcrisis drop in average deposit amount is not statistically different for community banks and commercial banks ($\beta = -135.1$, $p = 0.687$). However, the coefficient is noisy and not a precise 0. Thus, although the organization-level findings are consistent with our predictions, we cannot claim statistical support for Hypothesis 1. Models 4 and 5 run OLS regressions of credit unions' deposit amount on a postcrisis dummy. Model 4 indicates that, on average, credit unions' deposit amount is statistically smaller postcrisis ($\beta = -11.9$, $p = 0.000$). Note, however, that this decline is significantly less than the decline for banks ($p = 0.000$), with banks suffering over 10 times the fall in deposits after the crisis than credit unions on average. Thus, even though all financial organizations suffered a decline in deposits due to the financial crisis, credit unions did much better than banks on a relative basis, consistent with our theory. Model 5

Table 2. Summary Statistics and Correlation Table (Market-Level)

		Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	*Market deposits amount* (in billions)	15.54	42.18	1.00								
(2)	*CU deposit market share*	0.21	0.14	−0.26	1.00							
(3)	*Large bank deposit market share*	0.44	0.21	0.42	−0.43	1.00						
(4)	*Community bank deposit market share*	0.19	0.15	−0.22	−0.16	−0.55	1.00					
(5)	*Multibond CU deposit market share*	0.09	0.13	−0.13	0.37	−0.19	−0.03	1.00				
(6)	*Single-bond CU deposit market share*	0.02	0.11	−0.01	0.28	−0.10	−0.05	0.01	1.00			
(7)	*Bank net charge-offs* (%)	0.82	1.53	0.04	0.02	0.10	−0.11	−0.02	0.00	1.00		
(8)	*Bank delinquency* (%)	3.37	2.17	0.10	0.03	0.15	−0.17	−0.03	−0.03	0.44	1.00	
(9)	*CU net charge-offs* (%)	0.70	0.59	0.08	−0.04	0.17	−0.12	−0.05	0.02	0.20	0.38	1.00
(10)	*CU delinquency* (%)	3.53	3.67	0.10	−0.10	0.11	−0.03	−0.04	−0.01	0.03	0.04	0.13
(11)	*No. of bank branches*	166.20	258.54	0.82	−0.35	0.47	−0.23	−0.15	−0.01	0.04	0.09	0.09
(12)	*No. of CUs with branches*	22.21	28.93	0.70	−0.28	0.46	−0.25	−0.12	0.01	−0.01	−0.03	0.01
(13)	*Median HH income* (in thousands)	47.58	9.56	0.34	−0.09	0.39	−0.31	−0.08	0.04	0.06	0.13	0.02
(14)	*Government employees* (%)	8.83	4.27	−0.12	0.21	−0.27	0.19	0.21	0.23	−0.01	−0.04	−0.03
(15)	*Population* (in millions)	0.67	1.16	0.85	−0.29	0.47	−0.27	−0.13	0.01	0.03	0.07	0.09
(16)	*Age above 50* (%)	31.54	5.10	−0.09	−0.01	0.10	−0.13	−0.02	−0.14	0.09	0.20	0.07

		(10)	(11)	(12)	(13)	(14)	(15)
(10)	*CU delinquency* (%)	1.00					
(11)	*No. of bank branches*	0.12	1.00				
(12)	*No. of CUs with branches*	0.16	0.86	1.00			
(13)	*Median HH income* (in thousands)	−0.01	0.41	0.38	1.00		
(14)	*Government employees* (%)	−0.05	−0.17	−0.16	−0.06	1.00	
(15)	*Population* (in millions)	0.13	0.95	0.86	0.40	−0.15	1.00
(16)	*Age above 50* (%)	−0.01	−0.11	−0.10	−0.05	−0.39	−0.15

includes the interaction term between *Post crisis* and *Single-bond credit unions*, as well as the interaction term between *Post crisis* and *Multibond credit unions*, with other credit unions as the omitted category. Results in Model 5 suggest single-bond credit unions, on average, fared better postcrisis than multibond credit unions, with the difference of the interaction coefficients being marginally significant ($p = 0.064$), consistent with our predictions in Hypothesis 2.

Market-Level Analysis

The baseline market-level results are presented in Table 4. Model 6 runs OLS regressions of the market-level deposit market amount on a postcrisis dummy, while controlling for market fixed effects as well as time-varying market-level characteristics as specified before. It shows that, on average, the deposit amount for an average market is statistically smaller than its level in 2004–2006 ($\beta = -2.4$, $p = 0.000$), consistent with our organizational-level analysis showing that deposits shrank across the board after the crisis. This result sets a baseline for interpreting our results: because the financial crisis triggered a significant economic downturn, deposits overall would shrink. The more interesting question is therefore whether bank deposits shrink relatively more than credit-union deposits, as our theory would predict, and how subcategories, such as single-bond credit unions, performed. Therefore, we want to focus on relative effects rather than absolute effects.

Models 7–8 run OLS regressions of various market-level deposit market shares on a postcrisis dummy, while controlling for market fixed effects as well as time-varying market-level characteristics as specified before. Model 7 shows that, postcrisis, the credit-union deposit ratio was significantly higher than that of 2004–2006 ($\beta = 0.0172$, $p = 0.000$). The result is economically meaningful as well: the estimated coefficient in Model 5 indicates that in 2007–2012 the credit unions' deposit market share was, on average, 1.72 percentage points proportionally higher than that of 2004–2006, which is equivalent to an increase of approximately \$87.3 billion at 2006 deposit levels. This result also echoes the findings at the organizational level, where although an average credit union and an average commercial bank both experienced a decrease in deposit amount postcrisis, the estimated negative coefficient for an average bank was more than 10 times higher in magnitude than that of an average credit union.

Models 8A and 8B investigate Hypothesis 1 by running two separate OLS regressions on the deposit market share of community banks and commercial banks. As predicted, we see a significant and negative relationship between *Post crisis* and *Community banks' deposit market share*. In economic terms, *Post crisis* is associated with a 1.95-percentage-point decrease in deposit market share for community banks. At the same time, the coefficient of *Post crisis* and *Commercial banks' deposit market share* is also negative and

Table 3. The Effect of *Post Crisis* on Organizations' Deposit Amount

	M1	M2	M3	M4	M5
	DV: *Organization deposit amount*	DV: *Bank deposit amount*	DV: *Bank deposit amount*	DV: *Credit union deposit amount*	DV: *Credit union deposit amount*
Post crisis	−72.7454**	−182.5216**	−59.7920	−11.8918***	−14.3650***
	(31.7883)	(91.0026)	(359.0408)	(2.0262)	(3.0223)
Post crisis × *Community banks*			−135.1309		
			(335.0293)		
Post crisis × *Single-bond credit unions*					10.1370**
					(5.1063)
Post crisis × *Multibond credit unions*					1.8152
					(1.9931)
Org net charge-offs (%)	−0.0197	−0.8833	−1.0853	−0.0339	−0.0354
	(1.1692)	(3.5003)	(3.5516)	(0.0382)	(0.0388)
Org delinquency (%)	0.0160	1.5002	1.3719	0.0027	0.0032
	(0.0274)	(4.9234)	(4.8055)	(0.0022)	(0.0022)
Number of branches	126.8922***	126.9591***	126.8952***	68.0369***	68.1411***
	(10.4848)	(10.5557)	(10.6345)	(8.4656)	(8.5008)
Median HH income	0.2464	3.7459	3.1842	0.6599**	0.5710**
	(4.0022)	(12.4202)	(12.8238)	(0.2608)	(0.2567)
Government employee (%)	16.3683	38.7643	38.5828	−4.3803*	−4.4825*
	(18.5872)	(45.9671)	(45.8378)	(2.5239)	(2.5103)
Constant	−1.60e+03***	−4.18e+03***	−4.13e+03***	−215.3274***	−212.2488***
	(512.4479)	(1,354.2212)	(1,319.9811)	(37.7953)	(37.6023)
R^2	0.9696	0.9695	0.9695	0.9711	0.9711
Organization fixed effects	Yes	Yes	Yes	Yes	Yes
Other market-year controls	Yes	Yes	Yes	Yes	Yes
Observations	91,957	32,537	32,537	59,420	59,420

Notes. Dependent variables are in millions. In Model 3, large commercial banks are the omitted category. In Model 5, other credit unions are the omitted category; sample includes credit unions and banks that are headquartered in metropolitan areas.

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

significant. In economic terms, *Post crisis* is associated with a 1.06-percentage-point decrease in deposit market share for commercial banks. Thus, both commercial banks and community banks were negatively affected by the financial crisis, as predicted by our Hypothesis 1. Moreover, the difference between the coefficients for the community banks and the commercial banks is not statistically significant ($p = 0.234$). These results are consistent with our argument that legitimacy shocks hurt organizations in the focal category equally, regardless of their typicality.

Models 8C and 8D investigate Hypothesis 2 by running separate OLS regressions on the deposit market share of multibond and single-bond credit unions. As predicted, in Model 8C, the coefficient of *Post crisis* and *Multibond credit unions' deposit market share* is not significant. Note, however, that the difference between the coefficient for the community banks and multibond credit unions is statistically significant ($p = 0.002$), implying that organizations with a low grade of membership in the tainted category (community banks) did poorly relative to organizations with a low grade of membership in the oppositional category (multibond credit unions) postcrisis, further supporting the postcrisis advantage of credit unions relative to banks. In Model 8D, we see a significant and positive relationship between *Post crisis* and *Single-bond credit unions' deposit market share*. In economic terms, *Post crisis* is associated with a 0.46-percentage-point increase in deposit market share for single-bond credit unions, with the difference between this coefficient and that of the multibond credit unions being statistically significant ($p = 0.040$). Models 8C and 8D thus confirm our prediction that the increase in deposit market share is stronger for single-bond than multibond credit unions. We see these results as consistent with our argument that typical organizations in the oppositional category benefit the most when the focal category suffers from a legitimacy shock, thus supporting Hypothesis 2. Combined with the results in Models 8A and 8B on the side of commercial banks, Table 4 thus offers consistent support for our theory on the asymmetric returns to typicality.

Table 4. The Effect of *Post Crisis* on Total Deposit Amount and Deposit Market Share

	M6	M7	M8A	M8B	M8C	M8D
	DV: *Market deposit amount*	DV: *CU deposit market share*	DV: *Large bank deposit market share*	DV: *Community bank deposit market share*	DV: *Multibond CU deposit market share*	DV: *Single-bond CU deposit market share*
Post crisis	−2.3960***	0.0172***	−0.0106***	−0.0195***	−0.0020	0.0046***
	(0.5618)	(0.0029)	(0.0041)	(0.0037)	(0.0017)	(0.0016)
No. of bank branches	0.0858***	0.0000	0.0000	0.0001**	0.0000	0.0001***
	(0.0246)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
No. of CUs with branches	−0.9831***	0.0025***	−0.0022***	−0.0008***	0.0006***	0.0004***
	(0.1516)	(0.0003)	(0.0004)	(0.0003)	(0.0001)	(0.0001)
Mkt bank net charge-offs (%)	−0.0374	0.0003	−0.0008	0.0008	−0.0001	0.0004
	(0.0496)	(0.0003)	(0.0005)	(0.0006)	(0.0002)	(0.0003)
Mkt bank delinquency (%)	−0.0313	0.0004	0.0077***	−0.0060***	0.0004	−0.0016***
	(0.1348)	(0.0007)	(0.0009)	(0.0008)	(0.0003)	(0.0005)
Mkt CU net charge-offs (%)	0.4733	−0.0016	0.0014	0.0074***	−0.0014**	0.0011
	(0.3661)	(0.0016)	(0.0028)	(0.0024)	(0.0006)	(0.0013)
Mkt CU delinquency (%)	0.0291	−0.0003	0.0001	0.0009	0.0001	−0.0002**
	(0.0315)	(0.0003)	(0.0003)	(0.0007)	(0.0001)	(0.0001)
Median HH income	0.2736**	−0.0006	0.0022***	−0.0016***	−0.0001	−0.0004*
	(0.1232)	(0.0004)	(0.0006)	(0.0005)	(0.0003)	(0.0002)
Government employees (%)	47.6313**	0.7523*	−0.6762*	0.3472	−0.1299	1.1220***
	(20.2136)	(0.4345)	(0.3536)	(0.4058)	(0.1982)	(0.3772)
Constant	−30.9402***	0.1051**	0.4213***	0.2699***	0.0582***	−0.0868**
	(9.2561)	(0.0453)	(0.0461)	(0.0429)	(0.0212)	(0.0364)
Wald test: *LargeBK* = *CommunityBk*				1.41 (p = 0.2344)		
Wald test: *CommunityBK* = *MultiCU*					9.76 (p = 0.0018)	
Wald test: *MultiCU* = *SingleCU*						4.24 (p = 0.0396)
R^2	0.9531	0.8983	0.9194	0.8817	0.8809	0.6734
Market fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Other market-year controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,411	3,411	3,411	3,411	3,411	3,411

*p < 0.10; **p < 0.05; ***p < 0.01.

Post Hoc Analysis: Switchers vs. Differential Attrition Rate

As argued above, our theory for why single-bond credit unions gained market share postcrisis is that of "switching," that is, people who were not banking with single-bond credit unions before are now banking with them (and potentially closing bank accounts). One alternative explanation is that of the "differential attrition rate," that is, the crisis affected deposit holders at banks and credit unions differently, especially single-bond credit unions, so that bank customers withdrew their money at a higher rate from banks than single-bond credit-union customers from credit unions, without any switching between them.

Our organizational-level data allow us to conduct post hoc analyses of these proposed mechanisms. In the case of switching, we would expect single-bond credit unions to have an increase in new members and accounts. In the case of "differential attrition rate," we would expect single-bond credit unions to not experience such an increase.

In Table 5, Models 9–11 run OLS regressions of credit unions' number of deposit accounts, membership, and deposit amount per membership on a postcrisis dummy. Our evidence appears to be more consistent with the "switching" mechanism, because we see a postcrisis uptick in memberships and the number of accounts for single-bond credit unions, relative to other credit unions, but not in the deposit amount per account.[19] At the same time, we do not see a significant increase in the number of accounts or members for multibond[20] or other credit unions; on the contrary, the coefficient of the main effect of *Post crisis* is negative and significant, implying that

Table 5. Post Hoc Analysis I: Switchers vs. Differential Attrition Rate

	M9	M10	M11
	DV: *Number of accounts*	DV: *Number of members*	DV: *Deposit amount/account*
Post crisis	−1.6748***	−1.0910***	−0.1948***
	(0.5325)	(0.2462)	(0.0221)
Post crisis × *Single-bond credit unions*	2.1598**	1.3885***	−0.0865**
	(0.9267)	(0.4222)	(0.0338)
Post crisis × *Multibond credit unions*	0.7706***	0.4458***	0.0113
	(0.2890)	(0.1438)	(0.0169)
Constant	0.8193	2.4398	−4.3678***
	(4.7091)	(2.3322)	(0.3450)
R^2	0.9861	0.9878	0.8172
Organization fixed effects	Yes	Yes	Yes
Observations	59,420	59,420	59,420

Note. In all models, other credit unions are the omitted category, and the dependent variable is in thousands. Sample includes credit unions and banks that are headquartered in the metropolitan areas. Controls are the same as Table 3, Model 4.

$^{**}p < 0.05$; $^{***}p < 0.01$.

other credit unions lost both accounts and members following the crisis. Our results seem more consistently with the "switching" mechanism than the "differential attrition" mechanism and, therefore, strongly support the idea that only organizations with the highest grade of membership in the oppositional category will gain from a legitimacy shock as audience members switch to them. In particular, we believe these findings are consistent with our theoretical argument on typicality, because we expect typicality to be most important for customers who are new to the category. To use an example from another industry, if one decides to drink craft beers instead of beers produced by corporate brewers, one would try to stay away from those craft beers that are perceived to be "just like Bud" (Frake 2016, p. 1). By showing evidence that customers actually chose to move to single-bond credit unions, this analysis offers even stronger support of our theory.

Post Hoc Analysis: Community Embeddedness at the Market Level

The second post hoc analysis we conduct is for the moderating effect of community embeddedness. Our theory revolves around a social process in which the perception of illegitimacy spreads across actors and drives the search for an oppositional category, which is informed by social cues. We thus expect the strength of our prediction to be moderated by the nature of the community in which these social actors are embedded.

The literature has demonstrated that community structure—the aggregation of the social networks that connect actors—shapes the strength and direction of information diffusion (Laumann et al. 1978, Coleman 1988, Burt 2000). The community in which actors are embedded also supplies cognitive and normative frames for interpreting information and directing actions (Scott 2003, Marquis and Battilana 2009, Yue 2015). Therefore, the communities in which actors are embedded are significant sources of variation in their abilities to diffuse information about, and shape each other's approval of, a particular type of organization (Marsden and Friedkin 1993, Strang and Soule 1998).

In the context of legitimacy shocks, actors are more likely to engage in imitated defection from the implicated organizations (Iyer and Puri 2012, Yue et al. 2013, Greve and Kim 2014) when they are in a highly embedded environment, both because such environments are more likely to expose them to prior defectors (Jensen 2006) and because such environments provide more incentives to "follow the leaders" (Haveman 1993). Our theory thus implicitly predicts a positive moderating effect of credit-union gains by community embeddedness, where communities with high embeddedness experience a stronger legitimacy shock and therefore higher relative advantages for the oppositional category.

We test this moderating effect in Table 6, which runs different subsample analyses on the deposit-share ratio of credit unions. We draw on the 2000 Social Capital Community Benchmark Survey (SCCBS; Roper Center 2002), for which we received sensitive data access, to construct measures for the aggregate levels of community embeddedness in the different geographic areas. We code information for two measures: (1) organized group interactions (*OrgInt*), which measures respondents' engagements in attending public meetings, club meetings, and local community events; and (2) informal social interactions (*InfSoci*), which measures the number of activities in which the

Table 6. Post Hoc Analysis II: Community Embeddedness

	M12A	M12B	M13A	M13B	M14A	M14B	M15A	M15B
	DV: *Credit union deposit market share*				DV: *Single-bond credit union deposit market share*			
	Low *OrgInt*	High *OrgInt*	Low *InfSoci*	High *InfSoci*	Low *OrgInt*	High *OrgInt*	Low *InfSoci*	High *InfSoci*
Post crisis	0.0021	0.0146***	0.0048*	0.0124***	–0.0019	0.0099***	–0.0003	0.0095*
	(0.0027)	(0.0032)	(0.0025)	(0.0033)	(0.0019)	(0.0028)	(0.0018)	(0.0029)
Chi-square test of differences across split sample		10.19 (*p*-value: 0.0014)		3.65 (*p*-value: 0.0560)		7.48 (*p*-value: 0.0062)		4.70 (*p*-value: 0.0301)
R^2	0.9432	0.9104	0.9456	0.9091	0.6111	0.6978	0.6875	0.6652
Market fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,557	1,557	1,557	1,557	1,557	1,557	1,557	1,557

Note. Controls are the same as Table 4, Model 7.
$^{*}p < 0.10$; $^{***}p < 0.01$.

respondent is engaged, in terms of having friends visit their homes, visiting with relatives, socializing with coworkers outside of work, hanging out with friends in public places, and playing cards and board games. Responses to these items were weighted to account for differences in sampling errors and aggregated by geographic area to reflect overall levels of collective community participation.

Models 12A and 12B run a split-sample analysis based on the below- and above-median levels of community embeddedness, measured by the level of civic participation in the community.[21] We find evidence that markets with higher levels of organized group interactions (e.g., attending local community events) experienced a larger postcrisis increase in credit unions' deposit market share than markets with lower civic participation. The credit unions' deposit ratio in 2007–2012 was, on average, 1.5-percentage-points higher than in 2004–2006 in high-organized-group-interaction markets (Model 12A) and 0.2-percentage-points higher in low-organized-group-interaction markets (Model 12B). Tests of coefficient differences across the models suggest we can reject the equality of the coefficients at close to the 0.1% confidence level (*p*-value of 0.0014). Similarly, Models 13A and 13B run split-sample analyses based on the below- and above-median levels of informal social interactions (e.g., hanging out with friends). We find evidence that the markets with higher levels of informal social interactions experienced a marginally significantly larger postcrisis increase in credit unions' deposit market share (*p*-values of 0.056). These results are consistent with our argument that the postcrisis increase of credit-union deposit market share is driven by a social process of the diffusion of legitimacy shocks, which is stronger in more embedded communities.

Models 14–15 show how community embeddedness affects single-bond credit unions. We run split-sample analyses based on the below- and above-median levels of organized group interactions and informal social interactions. In both sets of models, we find evidence that the markets with higher community social capital experienced a significantly larger postcrisis increase in single-bond credit unions' deposit market share. These results are again consistent with our argument that the postcrisis increase in single-bond credit unions was higher in areas where the magnitude of legitimacy shocks toward banks was higher. Overall, we find effects are stronger in communities with higher levels of embeddedness, which is consistent with our theory and points to the relative gains of credit unions being driven by a social process.

Robustness

Our regressions include market or organizational fixed effects and control variables that rule out a large number of alternative explanations. We also conduct a battery of robustness tests to further examine alternative explanations for why credit unions were advantaged over banks after the crisis. These robustness tests include investigating the role of interest rates, economic recessions, social movements, the Dodd-Frank Act, community credit unions, and the consolidation of credit unions. These results are presented in Online Appendix 1, and the patterns across these robustness tests continue to provide support for our theoretical arguments.

Discussion

Our work extends our understanding of the benefits of typicality for organizations within and across categories. An extensive literature suggests that typical members of a category have higher audience appeal and better performance (Zuckerman 1999, Hsu 2006, Hsu et al. 2009, Kovács and Hannan 2010, Kim and Jensen 2011, Smith 2011, Pontikes 2012, Negro and Leung 2013, Leung 2014, Leung and Sharkey 2014, Kovács and Hannan 2015, Goldberg et al. 2016).

A second, distinct literature suggests the legitimacy of categories themselves may be challenged and disrupted (Jonsson et al. 2009, Ruef and Patterson 2009, Navis and Glynn 2010, Vergne 2012, Piazza and Jourdan 2018). We connect these two streams of research on categories to explicate the role of typicality in the context of legitimacy shocks. Extending the two-stage model from the categories literature (Zuckerman 1999, 2016; Phillips and Zuckerman 2001; Cattani et al. 2017; Zhao et al. 2017), we suggest the effects of legitimacy shocks are asymmetrically influenced by typicality. Members of the tainted, focal category suffer equally, irrespective of their typicality, whereas only the typical members of the newly favored, oppositional category benefit.

We test these ideas in the financial services industry and find support for our theoretical arguments. In the wake of the financial crisis, both traditional and community banks suffer from the public disapproval of the largest global banks. However, single-bond credit unions, the most typical of their (oppositional) category, reap the benefits of this shock to legitimacy. Multibond credit unions, though members of a different category than banks and offering many of the same services, do not experience gains. We find the deposit amount for an average organization and an average market is statistically smaller than it was in 2004–2006. However, the magnitude of the drop in deposits at the organizational level is 10 times greater for banks than for credit unions. Within credit unions, deposits fall more steeply for multibond credit unions and other credit unions than for single-bond credit unions, while both community and large banks see an equal decline, consistent with our predictions. In terms of market share, the postcrisis period is associated with a 1.95-percentage-point decrease in deposit market share for community banks and a 1.06-percentage-point decrease for commercial banks. Meanwhile, the postcrisis period is also associated with a 0.46-percentage-point increase for single-bond credit unions and a statistically insignificant effect on multibond credit unions. Together, these findings lead us to estimate that, during 2007–2012, the credit unions' deposit market share was, on average, 1.72-percentage-point higher than that of 2004–2006, which is equivalent to an increase of approximately $87.3 billion from 2006 deposit levels. Moreover, post hoc analyses show the gains of single-bond credit unions are driven by an increase in the number of their members and accounts, consistent with depositors switching to these credit unions from other organization types. Finally, the gains experienced by credit unions in general, and single-bond credit unions in particular, are stronger in markets with greater community embeddedness, consistent with these gains being driven by a social process of diffusion of the legitimacy shock.

We contribute to the literature on categories by strengthening the case for typicality. Complementing extant research that has documented benefits of typicality in stable categories, our result suggests that typicality will also operate favorably when oppositional categories are being challenged. These results suggest that strong conformity to a category could be a strictly dominant strategy (e.g., Kuilman and Li 2009). Next, by examining the heterogeneity of typicality within a category, our paper also lends insights to the strategy literature that increasingly leverages concepts from the category research (Zhao et al. 2017, Pontikes 2018). Our results suggest that typical organizations have the most to gain from increasing legitimacy of a category, which has implications for which sets of organizations have the strongest incentives to build and maintain legitimacy of a category. For example, Hsu and Grodal (2015) find that tobacco firms strategically manipulate category features to reduce the scrutiny of category offerings. If there were no heterogeneous benefits to be gained, these activities would create equal benefit for every member in the category and not occur very often. In practice, incumbents frequently try to improve the legitimacy of their category, precisely because they can benefit disproportionally (Yue et al. 2013).

Our study extends the two-stage model from contexts where categories are established and stable to those where categories are challenged and disrupted (Zuckerman 1999, 2016; Phillips and Zuckerman 2001), suggesting the cognitive underpinnings of how categories are created and sustained across markets (Vergne and Wry 2013, Cattani et al. 2017, Durand and Khaire 2017). Not only do we highlight the asymmetric role of typicality in moderating the effects of legitimacy shocks, our post hoc analyses also offer additional insights into the mechanisms through which these effects may come about. In particular, we find support for a "switching" mechanism, with single-bond credit unions gaining both members and accounts following the crisis. This finding suggests that more typical organizations in the oppositional category gain from legitimacy shocks, as audience members seek out organizations that are most typical in that category. In addition, the results of our post hoc analyses on the moderating role of community embeddedness show that the gains of credit unions are greater in highly embedded communities. This result is consistent with the diffusion of legitimacy shocks as a social process and suggests the losses to organizations in the tainted category, as well as the gains to typical organizations in the oppositional category, may be greatest in tightly knit communities.

Future studies may also try to pin down the precise mechanisms by which community embeddedness operates in this context (Audia and Rider 2010) or

further explore other mechanisms. For example, Kang (2008) and Janney and Gove (2017) found that innocent firms suffered adverse market responses if they shared board linkages with deviant firms implicated in stigmatizing events (e.g., fraud and options backdating). Another interesting avenue for future work would be to study how ties between actors, such as corporate board interlock, may be a conduit for spillover of legitimacy shocks (Davis 1991, Mizruchi 1996, Westphal et al. 1997).

As mentioned before, our theoretical argument also builds on and extends that of Piazza and Jourdan (2018). Whereas those authors consider the first stage of the two-stage model, and in particular explore the importance of cross-category similarity, we focus on within-category typicality. If we were to apply our theoretical framework to the empirical setting in Piazza and Jourdan (2018), we would predict that the loss of parishioners would be homogeneous within the Catholic church, but the gain of parishioners would be heterogeneous within the Protestant church. In response to the abuse scandals, parishioners would leave the Catholic church no matter how typical their particular church was or whether their own clergy was involved in the abuse. These disaffected parishioners move to the next closest category—the Protestant church—as demonstrated by Piazza and Jourdan (2018). But this effect would not be uniform across Protestant churches. Specifically, defecting parishioners would compare across Protestant churches and select the church that is most typically Protestant. Our theory is thus consistent with and complements Piazza and Jourdan (2018), in that they look at the choice between categories, whereas we look at the choice within categories.

Our work also contributes to research that demonstrates how governance structures are relevant to competition between organizations across many industries, including hospitals (Duggan 2002, Gertler and Kuan 2009), nursing homes (Lu 2016), education (Card et al. 2010), and media (Seamans 2012). The results from our study suggest an important factor underlying competitive interactions across all these other settings includes the perceived legitimacy of organizations within and across categories (e.g., county hospitals, nonprofit nursing homes, local schools, or city-owned cable television systems). We also see considerable value in exploring the impact of legitimacy shocks more generally. Although the financial crisis is one notable recent example, drastic shifts in social approval occur frequently, particularly in light of corporate scandals (Jensen 2006, Jonsson et al. 2009, Pontikes et al. 2010, Sharkey 2014). The incidence of these shifts in approval and the process by which they unfold (Lounsbury and Glynn 2001, Lounsbury 2002) have been explored in prior literature. In many industry settings, alternatives are present and have the potential to gain market share. Whether in the oil and gas industry, which spans firms with differing commitments to alternative energy, or in education, where nonprofit and for-profit models occupy adjacent categories, shocks to the legitimacy could have a dramatic impact on industry fortunes.

Finally, our focus on the financial crisis can be viewed as a contribution in and of itself. Responding to calls from previous work (e.g., Marquis et al. 2011), we have offered unique insights into what has thus far been the pivotal economic event of the 21st century. Considerable discussion occurred at the time about whether banks would suffer, and we are able to document that they indeed lost market share to credit unions. Further, we go deeper by explaining which kinds of credits unions benefitted, in which kinds of regions, and why.

We recognize several limitations in our current approach. Given our empirical setting, we measure variation in typicality by distinguishing between "more typical" and "less typical" organizations, essentially converting a continuous concept into a dichotomous one. This characterization can be relaxed in future work to develop further insights into the benefits of typicality. Relatedly, our analysis also focuses on a setting with a single alternate category, namely, the category of credit unions. This focus on a single oppositional category is consistent with our interest in understanding within-category choice. That said, the availability of such a close alternate category is an important boundary condition for our study. In contexts where two categories are "too far" apart from each other, the dynamics of competition after a legitimacy shock may be different.

Future research can thus consider how generalizable our theoretical propositions are to other settings, as well as how long lasting these effects are. Banks have recovered to precrisis levels in many areas, though skepticism from regulators and consumers persists. Building a general theory of the long-term effects of legitimacy shocks is an important priority for future work. Further, researchers may explore the robustness of our results under different valences of the shock by looking for settings of positive legitimacy shocks or settings where positive and negative legitimacy shocks co-occur. Future work could also explore settings where the less typical members of a focal category are considered culpable for the legitimacy shocks, instead of the more typical members, as in our case. We expect to see similar results, as there is recent evidence that audiences may extrapolate the acts of less typical members to the whole category (e.g., the rise of Islamophobia after terrorist attacks conducted by extremist Muslims, negative attitudes toward the entire for-profit education after the worst programs are closed down). That said, our paper is

limited to a specific shock, and further research on other shocks will add insight to our understanding of this complex phenomenon.

Finally, finer-grained data might allow even more careful empirical tests in future work. We know of no data source that follows individuals through time and records "switches" between banks and credit unions or granular data of deposit accounts for banks at the market level. We can only count deposits—a key indicator—but we are unable to demonstrate that consumers have abandoned banks entirely. In other settings, individual-level measurement might be more feasible. In the same spirit, our market-level analysis is limited in that we make use of the HMDA data to construct market-level deposit data for the credit unions.

Taken together, our findings contribute to the categories literature by bringing together two related streams of research. We examine how legitimacy shocks may affect organizations with varying grades of membership across and within different categories. We demonstrate that typical organizations might disproportionally benefit from legitimacy shocks that favor their category, suggesting the benefits of typicality may be robust when the legitimacy of categories is itself being challenged.

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Endnotes

[1] For example, *Popular Mechanics* writes "Pontiac owned the muscle scene in the early 1960s. In fact, the 1964 Pontiac GTO is widely regarded as the very first of the breed." https://www.popularmechanics.com/cars/g790/10-surprising-facts-about-american-muscle-cars/ (last accessed December 20, 2020).

[2] See https://web.archive.org/web/20170704153153/http://www.drivingtoday.com/kpix/greatest_cars/olds_rocket88 (last accessed December 20, 2020).

[3] We define oppositional category as the "next best," which is distinct from the focal category but most often offers similar or substitute products and services (Piazza and Jourdan 2018). We elaborate on these ideas below.

[4] Note that these organizations may or may not be typical of their category. In some cases, even actions triggered by the fringe members of the category may cause harm to the entire category. For example, in the case of Piazza and Jourdan (2018), even though the abuse scandal involved a few deviate priests, the shock negatively impacted the Catholic churches as a whole.

[5] Although there are many political parties in the United States and although some of them have had success at various points in history, we maintain that the U.S. political system can be perceived as a two-category field given that the two major parties have received the vast majority of votes in recent elections.

[6] Note that, in some cases, the oppositional category may endogenously emerge as the results of actors' strategic actions to reframe themselves as an alternative category (e.g., B Corporations; Gehman and Grimes 2017).

[7] We do not claim that typicality is the only dimension that audience members use when evaluating organizations in the oppositional category, but it is the dimension we choose to focus on given the prominence of typicality in the literature.

[8] In particular, H.R. 1151 "The Credit Union Membership Access Act," passed by the House, Senate, and signed into law by President Clinton in August 1998, authorized credit unions to have multiple "common bonds" among their membership. https://www.congress.gov/bill/105th-congress/house-bill/1151 (last accessed June 10, 2015).

[9] See https://www.forbes.com/2008/09/17/depression-crisis-banks-oped-cx_nr_0918roubini.html#4efb9a3226ec (last accessed December 20, 2020).

[10] Although we are unable to fully observe switching and therefore do not formally hypothesize it, we present some suggestive evidence for switching, by examining changes in the number of credit unions' accounts and members in a later section. To be clear, switching does not necessarily mean individuals will close their bank accounts and completely move all of their deposits to credit unions. It just means *some* of them will move *some* amount of money from banks to credit unions.

[11] We use deposit data from the yearly Summary of Deposits Database rather than quarterly Reports of Condition and Income, because the former contains comprehensive data at the branch level as well as the institutional level. We exclude savings banks and savings associations, as well as foreign-chartered institutions. We further restrict the sample to banks that are located within the 50 states and Washington DC.

[12] Other credit unions are credit unions for which the grade of membership is less clear than for single-bond and multi-bond ones, so we do not hypothesize about them. These include state-chartered credit unions, which cover a wide range of different organizations, and for which we have no systematic data on membership criteria. They also include so-called community credit unions that are smaller, local credit unions defined by their geographic coverage. We include these among other credit unions because it is unclear whether this constitutes a meaningful common bond between members.

[13] Note that a "year" in our setting begins June 30, rather than January 1, so the postcrisis dummy is for June 30, 2007 and after. We believe this approach is appropriate given (i) the increase in bank failures that began in early 2007 and (ii) the increase in foreclosures that began in late 2006. Results are robust to using a 2008 postcrisis dummy (which would correspond to June 30, 2008 and after).

[14] The charge-off ratio is calculated as the total amount of loans charged off during the year less all recoveries on charged-off loans during the year divided by average loans. The delinquency rate is the amount of loans 30 or more days past due divided by the amount of total loans outstanding. We calculate both measures at the institutional level, with bank data drawn from the Bank Regulatory Database in Compustat and credit union data from the NCUA call reports.

[15] We thank former NCUA's chief economist John Worth for his helpful suggestions that led us to use HMDA data for branching.

[16] In doing so, our assumption is that the amount of deposits in each market is highly correlated with mortgage loan originations. Details on the disaggregation method and a test for this assumption are reported in Chatterji et al. (2020).

[17] We follow the definition of the MSAs in the version of November 2004 by the Office of Management and Budget, available at http://www.census.gov/population/estimates/metro-city/List1.txt (last Accessed June 6, 2014).

[18] Angrist and Pischke (2009) point out in section 3.4.2 that an OLS regression is a valid approach to obtain the estimation of causal effects, even when the dependent variable is bounded in value. Nonlinear models do not substantially improve the estimation of marginal effects, although they may fit data more closely. The estimation of nonlinear models also needs more assumptions than the estimation of linear models. These additional assumptions can be especially complicated when considering panel data.

[19] We cannot compare these results to banks, because we do not have the number of deposit accounts for banks at the market level and banks do not have members in the way that credit unions do.

[20] Although the coefficient of the interaction of multi-bond credit unions is positive, it is significantly smaller than that of single-bond credit unions. Combined with the main effect of the postcrisis, it implies a net reduction in the number of accounts and members for multi-bond credit unions following the crisis.

[21] One may expect the level of community embeddedness to be highly correlated with education, which may also impact credit-union gains. We obtain measures of education (e.g., the percent of adults with a bachelor's degree or higher) from the census and find education has a moderate-to-low correlation with measures of community embeddedness (all under 0.25). Our main results also hold when including education as an additional control.

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Online Appendix

Categorical Competition in the Wake of Crisis: Banks vs. Credit Unions

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Appendix 1. Robustness Checks

We provide results from a battery of robustness tests that assess alternative specifications as well as alternative explanations for why credit unions were advantaged over banks after the crisis. Note that our regressions include market or organizational fixed effects and control variables that rule out a large number of alternative explanations, so we focus only on those explanations not already accounted for in our regressions.

Robustness to Alternative Functional Forms. Our dependent variable is *credit-union deposit market share*, which by construction is bounded between 0 and 1. We choose to run linear probability models on this variable. This approach is relatively standard in the literature, especially given the panel structure of our data set (for a broader discussion, see Angrist and Pischke 2009, especially pp. 105-107). Other papers that take a similar approach when using a financial ratio as a dependent variable include Vicente (2001) and Obloj and Sengul (2012). Although linear probability models have many benefits, one drawback is that predicted values may fall outside of 0 and 1 (Long 1997), which happens for about 0.03% of our observations. We therefore test the robustness of our results to alternative functional forms in Appendix Table A1.1.

AM1 of Table A1.1 replicates our main results from Table 3, model 7, where the dependent variable is the ratio of *credit-union deposit market share*. AM2 presents results without first taking the log of *credit-union deposit market share*. AM3 presents results after taking the log-odds ratio of *credit-union deposit market share*, which uses the following transformation: log (*credit-union deposit market share*/ (1- *credit union deposit market share*)). Before the transformation, observations with values of 0 are replaced with 0.001 and values of 1 are replaced with 0.999, an approach in David, O'Brien and Yoshikawa (2008). AM4 presents results after taking the arcsin transformation of *credit-union deposit market share*, which uses the following transformation: arcsin (squareroot (*credit-union deposit market share*)). AM5 runs a fractional logit model (Papke and Wooldridge, 2008) on *credit-union deposit market share*, while controlling for dummy variables for markets. The results are similar across these multiple transformations, suggesting our results are robust to alternative functional forms.

Interest Rate. Credit unions are known to provide higher rates than banks because of their not-for-profit tax-exempt status. We thus assess an alternative explanation that better interest rates could attract depositors to credit unions. In Appendix Table A1.2, we collect interest-rate data for both credit unions and banks, calculate average rate differences in each market, and split the sample into markets with high and low rate differences. Specifically, we obtain branch-level data on three-month checking interest rates for both banks and credit unions from January to June in 2007 from the SNL Financials database. We then aggregate the data to obtain market-level rate differentials between banks and credit unions. On average, credit unions do offer better rates than commercial banks. However, the difference is minimal with a mean of 0.31%. In Appendix Table A1.2, we run a split-sample analysis; we find no significant differences between markets with high and low rate differences.

Whereas these results suggest differences in the three-month checking rates did not attract depositors, credit unions offer a wide range of financial products that might otherwise have appealed to potential customers. Therefore, credit unions might have actively used rates on other products as a competitive device to attract customers post crisis. With these considerations in mind, we collect data on rates at credit unions and banks across other financial products at the national level and report them in Appendix Table A1.3. We find that whereas credit unions, on average, offer better rates on products such as CDs, money markets, and fixed-rate mortgages, banks offer better rates on credit cards, auto loans, and, to some extent, floating-rate mortgages. More importantly, minimal changes occurred in the rate differentials across banks and credit unions before and after the crisis. If anything, the gap in rates narrowed after the crisis. The combination of evidence suggests interest rates were unlikely to be the reason credit unions gained competitive advantage in the deposit market after the financial crisis.

The Great Recession. A second alternative explanation is that credit unions gain market share over banks during recessions more generally, and our results are unrelated to a specific threat to bank legitimacy. If this were the case, we would expect credit unions to gain market share during other recessions. We test this possibility by collecting historical data from Burger and Dacin (1992) on credit unions' deposits and accounts from 1940, during which the Federal deposit insurance became effective, to 1990, when the same data were last available from the source, at the national level. We combine the data on credit unions with historical data

on the timing of recessions from the National Bureau of Economic Research (NBER).[1] In Appendix Table A1.4, we run OLS regressions of various credit unions' deposit and account variables on a dummy for recessions. The coefficient on the recession dummy is negative but not statistically significant, and very small in magnitude. Therefore, we find no evidence of a relationship between recessions and changes in credit-union market share in general, which helps us rule out this alternative explanation.[2]

Social Movements. Aside from economic considerations, at least one high-profile social movement was aimed at explicitly encouraging Americans to shift their money away from large banks during our sample period. The Money Your Money (MYM) campaign at the end of 2009 was a challenge to large banks involved in the financial crisis.[3] Because this prominent social-movement campaign and related events happened after the initial move to credit unions had already begun, likely coinciding with other important unobserved factors, we are unable to precisely identify the causal effect of the MYM campaign or Bank Transfer Day.

That said, we use two dummy variables, Year 2007-2008 and Year 2009-2012, instead of Post Crisis to re-estimate the effect on credit-union deposit market share, reported in Appendix Table A1.5. A statistically significant difference exists between the coefficient Year 2007-2008 and Year 2009-2012 ($p=0.000$), suggesting the hypothesized effect was more pronounced in this later period. Whether the MYM campaign and Bank Transfer campaign were simply indicators of growing questions regarding bank legitimacy or an underlying trend or contributing factors remains an intriguing topic for future research.

The Dodd-Frank Act. It has been argued that community banks suffered from the Dodd-Frank Act due to the relatively large compliance costs (e.g., Lux and Greene 2015). To assess this alternative explanation of the impact of Dodd-Frank on community banks, Appendix Table A1.6 reports results after restricting the sample to 2004-2010, a period before the Dodd-Frank Act was signed into the law in July 2010. We find that our result is robust to excluding the period during which community banks may have been hurt by the regulation but not the legitimacy shock.

Community Credit Unions. We then substantiate our argument that categorical competition, not factors related to efficiently serving local customers, is driving our results. To do so, we first note our results suggest the presence of a positive and statistically significant coefficient of post crisis on other credit unions' deposit market share (Appendix Table A1.7, AM16, $\beta = 0.015$, $p = 0.000$). Other credit unions include community credit unions as well as state-based credit unions, both of which are locally oriented institutions. Specifically, community credit unions' membership requirements are based on geography, such that anyone who lives, works, or goes to school in a specified geographical area is eligible to open an account in a community credit union, similar to opening an account at a bank. State-chartered credit unions, meanwhile, operate and are subject to regulations at the state level. We split the dependent variable of other credit unions' deposit market share into state-charter credit unions' deposit market share as well as community credit unions' deposit market share in AM17A and AM17B, and find a statistically significant post-crisis increase in deposit market share for both types of credit unions. In terms of magnitudes, the change in deposit market share for both types of credit unions was significantly higher than for community banks. Although we did not formally hypothesize about other credit unions, this finding that locally oriented credit unions (i.e., community-bond credit unions and state-chartered credit unions), but not locally oriented banks (i.e., community banks), gained market share post crisis further supports our theory of categorical competition. If our results were driven by operational differences as opposed to categories, community banks should be gaining customers post crisis. Instead, we find community banks are losing customers while community credit unions are not, suggesting that what is driving our result is how the audience perceives what is typical of an organizational category.

Another potential concern is that the definition of community banks using asset size—which comes from the FDIC-does not capture the localness of community banks (Marquis & Lounsbury, 2007), and these

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[1] NBER recession dates available online at http://www.nber.org/cycles.html. Last accessed April 15, 2015.

[2] One might argue recessions could be bad for the legitimacy of many conventional institutions. Thus, even if we had found a move toward credit unions during other recessions, this finding would not necessarily have invalidated our findings in this paper. Moreover, the negative coefficient, although small in magnitude, is in the opposite direction of what we find following the recent financial crisis.

[3] Huffington, A. and R. Johnson, "Move Your Money: A New Year's Resolution," December 29, 2009. (http://www.huffingtonpost.com/arianna-huffington/move-your-money-a-new-yea_b_406022.html) Accessed August 13, 2014.

locally oriented community banks are more or equally embedded as federal credit unions and thus may fare better post crisis. To address this concern, we also included a new analysis, where we focus on two subpopulations: single-market community banks, which are supposedly the most deeply embedded in the community among all community banks, as well as community credit unions, which are geographically focused as per charters. We run a regression of deposit market share on the crisis dummy, and compare the coefficient of single-market community banks with that of community credit unions. As reported in Appendix Table A1.7, AM18, we find that single-market community banks continue to have a negative and significant coefficient, and a significant difference exists between single-market community banks and community-oriented credit unions.

Credit Union Mergers. We further explore the consolidation of credit unions in the aftermath of the crisis as an alternative explanation. In particular, single-bond credit unions that are losing market share could be more likely to become multi-bond credit unions, such that causality may run in the opposite direction. We explored the number of multi-bond credit-union foundings post crisis and found very few of them. Further, to rule out this reverse-causality concern, we conduct a robustness check in which we drop from our analysis all the multi-bond credit unions that were newly founded post crisis. Appendix Table A1.8 reports such analyses; we find results consistent with the main result.

Table A1.1. Alternative Specifications

Variable	(AM1)	(AM2)	(AM3)	(AM4)	(AM5)
Post Crisis	0.0172***	0.0953***	0.0133***	0.0219***	0.1161***
	(0.0036)	(0.0182)	(0.0027)	(0.0044)	(0.0178)
R^2	0.8983	0.9062	0.9015	0.9024	
Market Fixed Effects	Yes	Yes	Yes	Yes	
Other Market-Year Controls	Yes	Yes	Yes	Yes	Yes
Market Dummies					Yes
Observations	3411	3411	3411	3411	3411

Notes: Dependent variables are measured in a given market in a given year. Post crisis is a dummy variable that equals 1 for all years after 2007 inclusive, and 0 otherwise. Controls are the same as Table 3, Model 7. Robust standard errors, clustered at the market level, are included in brackets. *Significance level*: * p<0.10; ** p<0.05; *** p<0.01

Table A1.2. Split Sample Analysis by Rate Differential

Variable	(AM6) Credit unions' deposit market share	(AM7) Credit unions' deposit market share
	High Rate Differential (CU-Bank)	Low Rate Differential (CU-Bank)
Post Crisis	0.0161***	0.0131***
	(0.0045)	(0.0052)
Chi-square Test of Differences Across Split Samples		0.13 (P value: 0.7209)
R^2	0.9075	0.9017
Market Fixed Effects	Yes	Yes
Other Market-Year Controls	Yes	Yes
Observations	1161	1161

Notes: Dependent variables are measured in a given market in a given year. Coefficients of linear probability regressions. Post crisis is a dummy variable that equals 1 for all years after 2007 inclusive, and 0 otherwise. Controls are the same as in Table 3, Model 7. Robust standard errors, clustered at the market level, are included in brackets. *Significance level*: * p<0.10; ** p<0.05; *** p<0.01

Table A1.3. Comparison of Interest Rates across Credit Union and Bank Products over Time

	5 Year CD				Money Market				Interest Checking			
	CU	Bank	Diff	% Diff	CU	Bank	Diff	% Diff	CU	Bank	Diff	% Diff
2003	3.43	3.08	0.35	0.11	0.97	0.51	0.46	0.9	0.48	0.32	0.16	0.5
2004	4.07	3.61	0.46	0.13	1.01	0.57	0.44	0.77	0.48	0.34	0.14	0.41
2005	4.58	4.13	0.45	0.11	1.44	0.85	0.59	0.69	0.51	0.45	0.06	0.13
2008	3.61	3.34	0.27	0.08	1.33	0.72	0.61	0.85	0.52	0.42	0.1	0.24
2009	2.86	2.5	0.36	0.14	0.74	0.42	0.32	0.76	0.34	0.25	0.09	0.36
2010	2.58	2.3	0.28	0.12	0.47	0.29	0.18	0.62	0.25	0.19	0.06	0.32
2011	2.09	1.78	0.31	0.17	0.31	0.21	0.1	0.48	0.18	0.14	0.04	0.29
2012	1.53	1.04	0.49	0.47	0.21	0.1	0.11	1.1	0.11	0.06	0.05	0.83
2013	1.28	1.11	0.17	0.15	0.17	0.13	0.04	0.31	0.11	0.1	0.01	0.1
2014	1.34	1.15	0.19	0.17	0.16	0.12	0.04	0.33	0.1	0.09	0.01	0.11
	Credit Card				48 mo New Auto Loan							
	CU	Bank	Diff	% Diff	CU	Bank	Diff	% Diff				
2003	12.18	12.33	-0.15	-0.01	4.72	6.49	-1.77	-0.27				
2004	11.97	12.39	-0.42	-0.03	4.78	6.43	-1.65	-0.26				
2005	12.06	14.13	-2.07	-0.15	5.44	7.12	-1.68	-0.24				
2008	11.75	13.17	-1.42	-0.11	5.4	6.81	-1.41	-0.21				
2009	11.68	12.5	-0.82	-0.07	5.25	6.62	-1.37	-0.21				
2010	11.63	12.44	-0.81	-0.07	4.64	5.88	-1.24	-0.21				
2011	11.64	13.17	-1.53	-0.12	3.8	5.12	-1.32	-0.26				
2012	11.42	11.69	-0.27	-0.02	3.03	4.26	-1.23	-0.29				
2013	11.56	12.85	-1.29	-0.1	2.77	5.08	-2.31	-0.45				
2014	11.55	12.89	-1.34	-0.1	2.64	4.78	-2.14	-0.45				
	30 Year Fix Rate Mortgage				5 Year Adj Rate Mortgage							
	CU	Bank	Diff	% Diff	CU	Bank	Diff	% Diff				
2003	5.92	5.95	-0.03	-0.01	4.96	5.04	-0.08	-0.02				
2004	5.82	5.79	0.03	0.01	5.06	5.19	-0.13	-0.03				
2005	6.38	6.39	-0.01	0	5.82	6.09	-0.27	-0.04				
2008	6.55	6.56	-0.01	0	5.87	6.24	-0.37	-0.06				
2009	5.66	5.65	0.01	0	5.37	5.3	0.07	0.01				
2010	4.89	4.85	0.04	0.01	4.31	4.38	-0.07	-0.02				
2011	4.78	4.64	0.14	0.03	3.76	3.58	0.18	0.05				
2012	3.83	3.71	0.12	0.03	3.21	2.91	0.3	0.1				
2013	4.11	3.64	0.47	0.13	3.21	3.33	-0.12	-0.04				
2014	4.29	4.28	0.01	0	3.19	3.52	-0.33	-0.09				

Notes: Data drawn from the NCUA at http://www.ncua.gov/dataapps/pages/cubnkmain.aspx. Last accessed June 20, 2015.

Table A1.4. Alternative Explanation on Recession – Credit Union vs. Banks and Historical Recession, 1940-1990

Variable	(AM8) Total number of credit union members	(AM9) Total of credit union shares and deposits	(AM10) Total of credit union deposits	(AM11) Fraction of the credit union deposits over the total deposits at banks and credit unions
Recession	-1.5588	-9. 3588	-8.99e+04	-0.0027
	(1. 5376)	(9. 8321)	(9.67e+04)	(0.0016)
Trend	1. 2196***	2. 9948***	4.40e+04***	0.0014***
	(0. 0492)	(0. 3149)	(3095.7990)	(0.0001)
Constant	-7.1310***	-35.3643***	-3.42e+05***	-0.0064***
	(1. 5177)	(9. 7053)	(9.54e+04)	(0. 0016)
R^2	0. 9275	0.6556	0. 8090	0. 9342
Observations	51	51	51	51

Notes: Dependent variables are measured as yearly national aggregates. Historical data on credit unions are drawn from Berger and Dacin (1991). Historical data on banks are drawn from FDIC; recession data are drawn from NBER. Coefficients of OLS regressions are in models AM8-AM10, and linear probability regressions in model AM11. Standard errors are included in brackets. *Significance Level*: * p<0.10; ** p<0.05; *** p<0.01.

Table A1.5. Robustness of Table 3 (Split Period)

	(AM12)
	DV: CU Deposit Market Share
Year 2007-2008	0.0153***
	(0.0029)
Year 2009-2012	0.0432***
	(0.0043)
R^2	0.9007
Market Fixed Effects	Yes
Other Market-Year Controls	Yes
Observations	3411

Significance level: * p<0.10; ** p<0.05; *** p<0.01.

Table A1.6. Robustness of Table 3 (Drop if Year > 2010)

	(AM13)	(AM14)	(AM15A)	(AM15B)	(AM15C)	(AM15D)
	DV: Market Deposit Amount	DV: CU Deposit Market Share	DV: Large Bank Deposit Market Share	DV: Community Bank Deposit Market Share	DV: Multi-bond CU Deposit Market Share	DV: Single-bond CU Deposit Market Share
Post Crisis	-1.5288***	0.0152***	-0.0081*	-0.0190***	-0.0020	0.0036***
	(0.4686)	(0.0028)	(0.0040)	(0.0037)	(0.0015)	(0.0016)
Wald Test: LargeBK = CommunityBk				2.18 (p= 0.139)		
Wald Test: CommunityBK = MultiCU					10.03 (p= 0.002)	
Wald Test: MultiCU = SingleCU						4.48 (p=0.034)
R^2	0.9699	0.9138	0.9267	0.8912	0.8989	0.7174
Market Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Other Market-Year Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2653	2653	2653	2653	2653	2653

Significance level: * p<0.10; ** p<0.05; *** p<0.01.

Table A1.7. Community Credit Unions vs. Single-Market Community Banks

	(AM16)	(AM17A)	(AM17B)	(AM18)
	DV: Other Credit Union Deposit Market Share	DV: State CU Deposit Market Share	DV: Community CU Deposit Market Share	DV: Single-Market Community Bank Deposit Market Share
Post Crisis	0.0146***	0.0102***	0.0045***	-0.0133***
	(0.0024)	(0.0020)	(0.0014)	(0.0031)
Constant	0.1337***	0.1376***	0.0039	0.1160***
	(0.0325)	(0.0269)	(0.0177)	(0.0401)
Wald Test: CommunityCU = Single-Market CommunityBK				16.64 (p=0.0000)
R^2	0.9084	0.9099	0.9275	0.8039
Market Fixed Effects	Yes	Yes	Yes	Yes
Other Market-Year Controls	Yes	Yes	Yes	Yes
Observations	3411	3411	3411	3411

Significance level: * p<0.10; ** p<0.05; *** p<0.01.

Table A1.8. Alternative Explanation on Newly Founded Multi-bond Credit Union Post Crisis

	(AM19A)	(AM19B)	(AM19C)	(AM19D)
	DV: Large Bank Deposit Market Share	DV: Community Bank Deposit Market Share	DV: Multi-bond CU Deposit Market Share	DV: Single-bond CU Deposit Market Share
Post Crisis	-0.0104***	-0.0196***	-0.0020	0.0047***
	(0.0041)	(0.0037)	(0.0017)	(0.0016)
Wald Test: LargeBK = CommunityBk		1.50 (p= 0.2207)		
Wald Test: CommunityBK = MultiCU			9.84 (p= 0.0017)	
Wald Test: MultiCU = SingleCU				4.28 (p=0.0386)
R^2	0.9196	0.8817	0.8808	0.6737
Market Fixed Effects	Yes	Yes	Yes	Yes
Other Market-Year Controls	Yes	Yes	Yes	Yes
Observations	3411	3411	3411	3411

Significance level: * p<0.10; ** p<0.05; *** p<0.01.

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