STRUCTURE AT WORK: ORGANIZATIONAL FORMS AND THE DIVISION OF LABOR IN U.S. WINERIES

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ABSTRACT

We show how organizational forms shape job structures, specifically the variety and types of jobs employees hold, extending previous research on job structures in four ways. First, the social codes associated with wineries' generalist and specialist forms constrain the number of jobs and functional areas delineated by job titles. Second, form-based constraints are weakened by institutional rules that impose categorical distinctions on organizations. Third, these constraints are stronger when there is more consensus around forms. Fourth, these constraints are contingent on the legitimacy and resources of organizations of varying ages and sizes.

Keywords: Organizational structure; organizational form; categories; institutional isomorphism

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Jobs are fundamental building blocks in all organizations. They consist of stable bundles of tasks performed by employees under administrative titles (Cohen, 2013). Jobs determine what employees do and how productive they are. Jobs are packaged with financial and non-financial rewards and career opportunities; they are also accorded status and power. Variations in the content and form of jobs and the rewards, career opportunities, status, and power associated with them determine economic, social, and psychological outcomes for job-holders. For instance, within financial-service firms, jobs in investment banking and trading pay far more and have far higher status than jobs in research (Ho, 2009).

Jobs are arranged into functions, departments, and hierarchies; the structure of jobs in employing organizations – how tasks are divided up between employees and how employees are grouped together – has fundamental effects on employees' behavior and on their economic, social, and psychological well-being that range well beyond the additive effects of individual jobs. Job structures influence conflict (Fine, 2008), commitment and turnover (Lincoln & Kalleberg, 1985), and satisfaction (Schooler & Naoi, 1988; Wharton & Baron, 1987). Job structures also influence organizational cultures – the norms that pervade workplaces, the systems of meaning through which employees make sense of what they do and how they do it, and the agreements that develop about what workers value and disdain (Fine, 2008; Harrison & Carroll, 1991; Lincoln & Kalleberg, 1985).

Given the evident importance of job structures, it is not surprising that much has been done to understand how they develop. This effort has yielded two answers. First, job structures are driven by *internal requirements*, notably the scale, scope, and complexity of activities; the nature of administrative, production, or distribution technologies; the attributes and motivations of employees; and the history of the organization (Baron & Bielby, 1986; Blau & Schoenherr, 1971; Hickson, Pugh, & Pheysey, 1969; Kanter, 1977; Meyer, 1972; Meyer & Brown, 1977). Second, job structures are determined by *external factors* such as customer attributes, unions and professional associations, and location in the public versus private sector (Baron & Bielby, 1986; Strang & Baron, 1990).

We take research on job structures in a new direction by highlighting how *organizational forms* affect job structures, thus highlighting the interplay between internal and external causal forces (see also Burton & Beckman, 2007). Organizational forms are abstract, socially constructed categories into which observers fit particular organizations in order to evaluate them (Hannan, Pólos, & Carroll, 2007; Zuckerman, 1999). Organizational forms are fuzzy categories: category members may be more

or less typical of the category standard (McCloskey & Glucksberg, 1978; Rips, Shoben, & Smith, 1973; Rosch, 1973). The task facing observers is to decide how well organizations fit into any particular category – their grade of membership in that category (Hampton, 1998). As grade of membership increases, social acceptance is easier (Smith, 1978). Our focus on organizational forms as categories yields four novel conclusions about job structures. First, like many other social categories, typifications of organizational forms emerge as observers interact and develop a consensus about what the form is and is not (Hannan et al., 2007; Zuckerman, 1999). Our research shows that such social construction processes generate powerful cognitive schemas and normative expectations that drive form-specific isomorphism in job structures. Second, as categories, organizational forms can be created and maintained through the actions of recognized authorities, like the state, that construct institutional rules about the nature of forms and back those rules with rewards and sanctions (Bourdieu, 1984, pp. 480–481; Edelman, 1992). Our analysis demonstrates that when such institutional rules mandate membership in a form based on outputs or processes, but not on internal structures, tendencies toward form-based isomorphism are weakened. Third, within any category, members often vary considerably (McCloskey & Glucksberg, 1978; Rips et al., 1973; Rosch, 1973). Our analysis shows that isomorphic pressures are weakened by such variation. Finally, our research makes clear that categorical constraints on organizational forms are contingent on the legitimacy and material resources garnered by organizations of varying ages and sizes.

In addition to advancing research on job structures, we extend research on organizational forms as categories by showing that because grades of membership vary, violations of or adherence to that form's social code affect different form members differently. Such variation in response to category standards, while predicted by previous analysts of organizational forms as categories, has seldom been demonstrated empirically (for exceptions, see Waguespack & Sorenson, 2011; Zuckerman & Rao, 2004). We also show that product-based social codes influence organizations' behavior and structure in labor markets (Baron, 2004; Beckman & Burton, 2008, 2011), in addition to product markets.

Our empirical site is the wine industry in the United States between 1940 and 1990. This large and growing industry has long been both highly institutionalized and tightly constrained by internal (technical) requirements. The production, distribution, and sale of wine and other alcoholic beverages are scrutinized closely by federal and state authorities, and have often been contested over the course of U.S. history, from the time of

the first temperance associations in the early nineteenth century to recent court rulings on the interstate distribution of wine. At the same time, wineries must submit to prosaic technical concerns common to all agriculture-based ventures (unpredictable variations in sunlight, temperature, rainfall, disease, and pests) and to inherent limitations in the ancient but often poorly understood process of fermenting fruit into alcohol. Crucial to our analysis is the fact that there are two organizational forms in this industry – generalist mass producers and specialist farm wineries – which observers perceive as distinct categories (Swaminathan, 1995, 2001) and which should, therefore, maintain distinct patterns of tasks and employee allocation among tasks.

We begin by discussing organizational forms as categories. To do so, we combine sociological research on organizational categories with sociological and cognitive-psychological ideas about categories in general. We then develop hypotheses about how category membership affects job structures. After that, we describe our research site, focusing on its two principal organizational forms, and observers' perceptions of those categories. After describing our data, measures, and methods of analysis, we present empirical results. We conclude by drawing implications from our analysis for other types of organizations.

ORGANIZATIONAL FORMS AS CATEGORIES

Organizational forms are categories that audiences – individuals, groups, or formal organizations – use to judge organizations (Hannan et al., 2007; Zuckerman, 1999). Audiences perceive most categories, including organizational forms, as having graded structures: the members of a category vary in how good an example they are of that category, or how typical they are (Rips et al., 1973; Rosch, 1973, 1975; Smith, Shoben, & Rips, 1974). In other words, answers to questions about category membership are not binary ("In or out?"), but rather continuous ("How typical?"). Typicality is often termed grade of membership, to underscore its continuous nature. To understand how audiences assess grade of membership in an organizational form category, consider the category "university." Almost everyone would perceive the University of California at Berkeley, Emory University, and Oxford University as being in this category, so their grade of membership is high. And almost no-one would consider McDonald's Hamburger University, a training center for employees, to be a "true" university, so its

grade of membership is near zero. In the middle are entities such as the online University of Phoenix (a for-profit corporation with few regular faculty); its grade of membership is moderate: not low because some would view its campus-based structure and degrees as similar to "true" universities, but not high because others would view its for-profit status, reliance on web-based (rather than classroom) teaching, and revolving staff of part-time lecturers as different from "true" universities. (For more on this organizational category, see Hannan et al., 2007, pp. 16–17.)

Grades of Membership and Social Acceptance

Assessments of an organization's grade of membership have important consequences. Observers easily and quickly understand organizations with high grades of membership (Smith, 1978). They valorize organizations with high grades of membership as "pure," because they reinforce the notion of a comfortingly simple, common-sense world composed of distinctive categories (Bourdieu, 1984; Douglas, 2002 [1966]; Durkheim & Mauss, 1963 [1903], pp. 466–484; Zerubavel, 1991, pp. 33–60). In turn, ease of understanding and high moral worth legitimates organizations with high grades of membership, bringing them material resources, stability, and enhanced survival prospects (Carroll & Swaminathan, 2000; Meyer & Rowan, 1977; Phillips & Zuckerman, 2001; Zuckerman, 1999). In contrast, organizations with low grades of membership are at best ignored and at worst punished, because as ambiguous cases (not truly part of a category, but also not truly outside that category), they are perceived as "dangerous" because they make salient the inadequacy of classification schemes. In short, the perception of ambiguity as dangerous and of purity as comforting drives observers to conceive of organizational forms, like many other categories, as social codes – objective social facts backed by rewards and sanctions (Bourdieu, 1984; Douglas, 2002 [1966]; Durkheim, 1995 [1982], pp. 50–59; Durkheim & Mauss, 1963 [1903], pp. 466–484; Lamont & Molnár, 2002, pp. 168–169). As social constructions, codes come with rules of conduct that delimit what category members should and should not be and do, and signals that define what observers perceive category members (Hannan et al., 2007, pp. 21, 100–110).

Social codes associated with organizational forms can also develop through institutional mandate. Recognized authorities, such as the state or professional bodies, may specify codes for organizational forms and provide incentives for organizations that subscribe to those codes and

sanctions for organizations that fail to meet those codes (Edelman, 1992; Starr, 1992). For example, federal regulations define independent power plants (Sine, Haveman, & Tolbert, 2005) and an international nongovernmental organization certifies firms for quality management (Guler, Guillén, & Macpherson, 2002). The boundaries designated by these institutional fiats have very real consequences (Bourdieu, 1984, pp. 480–481; Zerubavel, 1991, pp. 28–32). For instance, for-profit and nonprofit organizations are commonly taxed differently and authorized to conduct different activities. But even the most detailed institutional fiats allow some discretion in how they are interpreted and applied (Edelman, 1992): such fiats often focus on procedures or outcomes, and leave open the question of what internal structures would yield the desired consequences (Dobbin, Sutton, Meyer, & Scott, 1993; Edelman, 1992). This means that there is a social-constructionist aspect to all social codes (Zerubavel, 1991, pp. 28–32; 70–80).

Assessing Grade of Membership

Assessing any organization's grade of membership essentially involves measuring the similarity of the focal organization to the "typical" member of the focal category (Hampton, 1998). But what is typical? Cognitive psychologists have considered three possible yardsticks: the central tendency, ideals, and familiarity. First, grade of membership may increase with the focal organization's *average* similarity to other category members (Rosch & Mervis, 1975; Smith et al., 1974). Second, grade of membership may depend on *ideal* characteristics, meaning those that any organization must possess to belong in the category; if so, grade of membership increases with the number of ideal characteristics possessed by the focal organization (for binary characteristics) or with the value of those characteristics (for graded polytomous or continuous variables) (Barsalou, 1985). Third, grade of membership may increase with *familiarity*, specifically, with the frequency of encountering the focal organization (Ashcraft, 1978; Glass & Meany, 1978; Hampton & Gardiner, 1983; Malt & Smith, 1982). The more frequently observers have encountered an organization, the higher its perceived grade of membership.

Experiments show that the central tendency is the best yardstick for grade of membership (Barsalou, 1985): measures based on the central tendency have more impact on subjects' assessments of grade of membership than measures based on ideals or familiarity. This result may be due to the

fact that category properties are not independent but rather positively correlated: each category property tends to co-occur with other properties. Thus, categories tend to circumscribe sets of entities that share clusters of co-occurring properties (Rosch & Mervis, 1975; Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). This result may also be due to the fact that categorization decisions are made most efficiently (fastest) using central-tendency data. The average absolute distance from all points in a set (such as all members of a category) to any particular point (such as the category standard) is minimized when that point is the mean. Since classification is easier (faster) when an entity is more similar to (closer to) the category standard (Smith, 1978), the ease of categorizing entities is maximized, and thus the time required is minimized, when the category standard is the central tendency.

Multiple Categories

Any given industry may contain multiple organizational forms, each of which is a different category and is associated with a different social code. Multiple form categories often develop when an industry becomes partitioned between generalists, which are generally large and offer a variety of products to meet diverse customer demand, and specialists, which are usually, but not always, small and offer a narrow range of products to meet the idiosyncratic demands of particular customer segments (Carroll, 1985; Carroll, Dobrev, & Swaminathan, 2002). This happens when industries are subject to economies of scale, and industry participants rely on resources (inputs and demand for output) that are distributed with a rich center and poor peripheral regions. Generalists compete with one another to control the resource-rich center by offering generic products with broad appeal. Specialists, meanwhile, avoid competing with generalists in the market center, instead exploiting peripheral regions by serving small groups of clients with idiosyncratic tastes. Because economies of scale favor large organizations, the generalist form concentrates: an ever-smaller number of ever-larger generalists competes for the market center. As this happens, generalists focus more tightly on the market center and abandon more of the periphery to specialists. The upshot of this partitioning of the resource space is that increasingly intense competition between generalists leads to not only higher failure rates for generalists, but also lower failure rates and higher founding rates for specialists. Such resource partitioning has been found in industries ranging from newspaper publishing to auditing, beer brewing, and automobile manufacturing (Carroll et al., 2002).

The social codes associated with the generalist and specialist forms differ greatly. The generalist code emphasizes offering a broad array of products, or products that appeal to a broad array of customers, and doing so at low prices. Generalists' low-price strategy translates to an emphasis in their social code on large-scale operations, which allow them to achieve economies of scale. For their part, the specialist code highlights fit with the particular needs of a narrow segment of clients, through products designed with their idiosyncratic tastes in mind. Specialists' differentiation strategy drives an emphasis on distinctive activities and outputs.

CATEGORICAL SOCIAL CODES AND JOB STRUCTURES

Our central thesis is that the social code associated with an organizational form category influences its job structures. The way tasks are grouped together into distinct jobs and work groups constitutes an "organizational language" (Meyer & Rowan, 1977, p. 349) that current and prospective employees use to understand their roles. "Speaking" this language signals employing organizations' conformity with the social codes associated with their particular form. Having job structures that meet external expectations not only brings organizations legitimacy, it also brings material resources, stabilizes operations, and enhances survival prospects (Meyer & Rowan, 1977). But organizations often face great uncertainty about the best way to divide up their tasks and people – not only the most technically efficient and effective way to operate, but also the most culturally legitimate way. The tasks organizations must accomplish, and thus the structures they must use to co-ordinate these tasks, vary with observers' expectations (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). This creates variation between organizational categories in the "typical" ways category members arrange employees' jobs. For example, advertising agencies must balance creative urges and profit motives; therefore, jobs in advertising agencies are divided between the creative side (e.g., copywriter) and the business side (e.g., account manager). Similarly, wineries face pressures to manage aspects of their operations that are distinctive to their organizational form, notably the growing of grapes; the fermenting, refining, and bottling of wine; and adherence to the strict regulations that govern all producers of alcohol in the United States. Therefore, wineries' job structures highlight these form-specific tasks (e.g., viticulturist, enologist, and compliance manager).

Our analysis focuses on the division of labor in job structures, in particular, the number of distinct *job titles* and the number of detailed *functional areas* delineated by job titles. These are easy to observe and they constitute labels that have significant social and economic consequences. For workers, job titles and functional designations signal status and serve as prominent markers of identity. For employing organizations, job titles and functional designations signal similarity to other organizations that use similar titles and distinctiveness from organizations that use different titles. In addition, the use of standard job titles arrayed across the usual functions and the expected set of hierarchical ranks smooths operations: it can facilitate recruiting and retaining scarce talent because these are the job structures that prospective employees have come to expect and therefore value.

Expectations about job structures are incarnated in the structures of other organizations in that category; specifically, the central tendency of category members (Barsalou, 1985). When organizational forms display sharp differences, as in industries partitioned into generalist and specialist forms, observers pay close attention to the job structures of other members of the same form, and little, if any, attention to the job structures of members of other forms. Moreover, because generalists tend to be larger than specialists, which makes them both far more visible than specialists and generally gives them greater legitimacy and superior material resources, we expect that decision makers in generalists organizations pay attention *only* to other generalists and not at all to specialists. We further expect that decision makers in specialist organizations pay attention to *both* generalists and to other specialists, but that other specialists have more impact than generalists, due to the natural tendency of decision makers to focus on organizations of the same form. Finally, we expect that external observers pay more attention to the more visible generalist organizations than to specialist organizations.

In addition to being focused on particular forms, attention is highly localized in space. Observers pay the most attention to nearby organizations because those are most visible, most likely to be directly connected to the focal organization through routine exchanges, and most likely to be in the same structural position (the same network position or role in the industry's web of exchange relationships) as the focal organization (DiMaggio & Powell, 1983). Perception of geographic boundaries like neighborhoods, counties, and states is a fundamental manifestation of how we categorize the world to make sense of it (Zerubavel, 1991, pp. 6–9). Accordingly, a form's category standard is limited to the set of form members within the same bounded geographical area as the focal organization.

Taken together, these ideas lead us to the following predictions:

Hypothesis 1a. The job structure of any generalist will resemble the average job structure of other nearby generalists.

Hypothesis 1b. The job structures of specialist organizations will resemble the average job structure of other nearby specialists.

Hypothesis 1c. The job structures of specialist organizations will resemble the average job structure of nearby generalists; this effect will be weaker than the effect of other specialists.

Institutionally Mandated Form Categories

As explained above, the state and other recognized authorities often specify codes for organizational forms (Bourdieu, 1984, pp. 480–481; Edelman, 1992) that are instantiated in legislation, professional creeds, or certifications. Since institutional rules defining organizational forms often focus on procedures or outcomes, and leave open the question of what structures would yield the desired consequences (Dobbin et al., 1993; Edelman, 1992), such rules allow organizations claiming institutionally mandated forms to decouple their internal structures from the procedures and outcomes that signal adherence to the institutional rules (Meyer & Rowan, 1977). We expect, therefore, that socially constructed form-based constraints on job structures are weakened by the existence of institutional rules that impose procedural and outcome-based categorical distinctions without specifying the job structures that satisfy those distinctions. In effect, state and other authorities create coercive institutions that serve as substitutes for socially constructed cognitive and normative institutions. Accordingly, we predict:

Hypothesis 2. The job structures of organizations are less affected by the average job structure of other nearby organizations in their form category when there is an institutional rule mandating category membership on the basis of procedures or outputs, but not structures.

Within-Category Variation

Observers do not usually agree completely about the social code associated with any organizational form (Hannan et al., 2007, pp. 67–69). We argued

above that clear boundaries between form categories generate form-specific isomorphic pressures. We argue here that form-specific isomorphic pressures are weakened when observers do not push organizations claiming a form in a single direction. Evidence of such within-category variation is seen in the structures of organizations in that category. The more variation among form members, the more "wiggle room" there is in the attendant social code, and the less any organization with that form can be viewed as typical. To put it simply, variation among form members reveals divergence of opinion about what organizations with that particular form should look and act like. Members of such varied or incoherent categories should have varied structures (McKendrick & Carroll, 2001; Zuckerman & Rao, 2004). When organizations with a particular form display substantial variation with regard to job structures, form membership is only weakly correlated with job structure. With increased variation in job structure comes reduced constraint, as attendant codes appear fuzzy or incoherent. Therefore, we predict that when and where there is greater variety in job structure among category members, form-based isomorphism is less pronounced:

> **Hypothesis 3.** The job structure of all organizations, generalists and specialists alike, are less affected by the average job structure of other nearby organizations in their form category when those other organizations are less similar to each other.

Size and Age Moderate Category-Based Isomorphism

Organizations vary in their susceptibility to cognitive and normative pressures to exhibit highly legitimate structures (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Strang & Tuma, 1993). Constraints stemming from form-based social codes do not apply equally to all firms. Instead, organizations are buffered from the negative consequences of violating the social codes associated with their forms, or from the positive consequences of adhering to those codes, when they are already highly legitimate and when they possess substantial slack resources: legitimacy allows organizations to weather disapproval, while slack resources makes approval unimportant. Two attributes of organizations – age and size – fundamentally affect legitimacy and material resources.

Size buffers generalist organizations from form-based constraints. This happens for two reasons. Larger generalist organizations have more market power than smaller ones (Pfeffer & Salancik, 1978, pp. 52–54). Also,

because size is valued in Western societies, and because size is intrinsic to their social code, larger generalist organizations are generally more esteemed than smaller ones. Finally, because larger generalist organizations are more visible than smaller ones, larger generalist organizations are more familiar, so they may feel less pressure to justify their job structures.[1] In sum, large generalist organizations possess greater legitimacy and more material resources than small ones, which cushion them from the constraints imposed by their form's social code.

Hypothesis 4a. The job structures of larger generalist organizations are less strongly affected by the average job structure of other nearby generalists than are the job structures of smaller generalists.

For specialist organizations, size strengthens, rather than weakens, form-based constraints. Like large generalists, larger specialists may be more able than smaller ones to resist pressures to conform to norms, including norms about job structures, due to their greater legitimacy and material resources. But the opposite is far more likely, that form-based constraints on specialists are strengthened by size. Specialists are likely to be perceived as less legitimate if they are very large because they resemble generalists more than other specialists. In other words, observers may confuse large specialists with generalists, which dilutes the identities of large specialists and exposes them to negative evaluations (Hannan et al., 2007) or to fewer positive evaluations (Zuckerman, 1999). In either case, confusion about which form they are more typical of delegitimizes large specialists. To reduce confusion and safeguard their legitimacy, large specialists may be especially likely to adopt job structures that are deemed appropriate for the specialist form. This prediction is strengthened by the fact that larger specialists are more visible than smaller ones; therefore, deviations from the specialist form's social code are easier to detect in larger specialists than in smaller ones.[2] In sum, size enhances pressures specialists face to have job structures similar to those of other nearby specialists:

Hypothesis 4b. The job structures of larger specialists are more strongly affected by the average job structure of other nearby specialists than are the job structures of smaller specialists.

Age buffers all organizations, generalists and specialists alike, from the constraints stemming from form-based social codes. New ventures have no reputations because they have no track records, apart from whatever reputation their founders may have acquired in the past. The lack of track record makes it hard for outsiders to evaluate young organizations. Even

insiders have difficulty evaluating fledgling ventures. Therefore, young organizations are particularly likely to be judged by criteria other than performance, such as their use of highly institutionalized job structures (Aldrich & Fiol, 1994; Stinchcombe, 1965). In contrast, many old organizations have venerable records of past achievements because they survived past rounds of environmental selection: old organizations were either lucky or capable; in either case, they triumphed over selection pressures and so established reputations (Levinthal, 1991; Stinchcombe, 1965). Nothing legitimates organizations more than longevity (Hannan & Freeman, 1989, p. 81). Moreover, older firms, having survived rounds of environmental selection, have garnered the material resources that younger firms lack (Levinthal, 1991). In addition, old organizations have forged relationships with suppliers, distributors, customers, oversight agencies, competitors, and trade and professional associations, all of which generate more material resources (Hannan & Freeman, 1989). In sum, because of their greater legitimacy, resources, and insularity, older organizations are less susceptible than younger ones to pressures to adopt common and therefore legitimate job structures. Therefore, we expect that age will weaken the impact of form-based constraints:

> **Hypothesis 5.** The job structures of all older organizations, generalists and specialists alike, are less strongly affected by the average job structure of other nearby organizations in their form category than are the job structures of younger organizations.

RESEARCH SITE: THE U.S. WINE INDUSTRY, 1940–1989

We test these hypotheses by analyzing the job structures of all wineries in the United States from 1940 to 1989. We chose to study a single industry because doing so controls by design several factors that prior research has shown affect job structures: production and product technology, employee and customer attributes, unionization, public versus private sector, and industry (e.g., Baron & Bielby, 1986; Strang & Baron, 1990). Our study period begins shortly after Prohibition ended and the wine industry rebounded; it ends around the time the industry was well established across the country, with wineries in 43 of 50 states, from California to Alaska and New Hampshire, and before the development of the World Wide Web

began to dramatically alter how all organizations, including wineries, described themselves.

The wine industry is an excellent setting for research on how job structures are shaped by form-specific social codes, for three reasons. First, wineries vary greatly in size and nature of operations, from huge firms such as Gallo and Canandaigua, which have massive operations in several states and so are likely to possess complex job structures, to small producers such as Mayacamas and Lenz, whose owners run their single facility directly and which therefore are likely to have simple job structures. Indeed, U.S. wineries mirror most American employers in that many are small (Aldrich & Auster, 1986; Granovetter, 1984), which facilitates generalizing the results of our analysis to other settings. Second, the distribution of firms in the U.S. wine industry has changed greatly since the repeal of Prohibition. The industry has seen both rapid concentration, as large mass-producer wineries gobbled up small ones, and the birth of many specialist farm wineries (Swaminathan, 1995, 2001). Third, distinctions between the identities of the two forms are strong, even though there has been considerable variation within each form in terms of observable characteristics. Thus, the U.S. wine industry offers substantial cross-sectional and longitudinal variation with which to tease apart the forces that shape job structures, while allowing us to contrast two distinct forms of organizations whose identities are almost complete opposites.

After Prohibition was repealed in 1933, the wine industry rebounded slowly. By 1940, when the industry had recovered some of its lost legitimacy and infrastructure, some 1,033 wineries operated across the United States. At that time, the major product segments for wine were dessert (sweet) and fortified wines. This was a result of the hard-drinking consumption patterns developed during Prohibition, which favored wines with high residual sugar levels and alcohol content, like those produced by home winemakers and bootleggers (Adams, 1990, pp. 28–29; Pinney, 2005, p. 441; Teiser & Harroun, 1984, p. 69). From the 1930s to the mid-1950s, only a few elite consumers sought out dry (tart) and low-alcohol table wines (Pinney, 2005). Changes in consumer preferences began to manifest themselves in altered patterns of wine consumption in the 1950s and 1960s, in particular in demand for dry table wines, partly due to increased exposure to imported old-world wines (Delacroix & Solt, 1988). Shipments of dry table wines rose more than 10-fold from 25,000 gallons in 1940 to 275,000 gallons in 1990, while shipments of sweet dessert wines fell by half, from 59,000 gallons in 1940 to 28,000 gallons in 1990 (*Wines & Vines Statistical Survey*, various years). In 1968, shipments of table wines

exceeded those of dessert wines for the first time. In addition, sales of sparkling wines rose from 0.7% of the domestic market in 1940 to 5.7% in 1990 (*Wines & Vines Statistical Survey*, various years). The wine industry was increasingly able to meet this demand because their stock of knowledge had been reinforced by an influx of European grape growers and wine-makers during and after World War II and enhanced by the resumption, after 1945, of scientific research in viticulture and enology. These shifts in consumption went hand-in-hand with the proliferation of specialist farm wineries, which were different in many ways from the generalist mass producers that had long dominated the industry (Adams, 1990; Pinney, 2005; Swaminathan, 1995).

Organizational Forms in the Post-Prohibition Wine Industry

U.S. wineries come in two main forms: mass producers and farm wineries. Distinctions between these two form categories became increasingly sharp over our study period. By the 1980s, it was very easy for observers to label any particular winery as a mass producer or a farm winery (Adams, 1990; Pinney, 2005).

Mass Producers

These medium-sized to large generalists produce a wide range of products aimed at the center of the market. Their competitive advantage comes from realizing economies of scale in production and advertising, and economies of scope in distribution. They are therefore concerned with power over suppliers, production efficiencies, control over distribution channels, and prices that will appeal to the majority of consumers.

One of the oldest mass-producer wineries is the Taylor Wine Co. of Hammondsport, New York, which was founded in 1880 (Pinney, 2005). It survived Prohibition, and up to the late 1960s, it sold primarily "American" versions of fortified and table wines, made mostly from Concord grapes, the most common native grape variety. Juice from Concord grapes is too high in acid and too low in sugar to make good wine, and it has an unpleasant musky taste. Taylor's wines were improved by adding water to dilute the acid and sugar to raise the potential alcohol level; they were also blended with better-tasting wine shipped in bulk from California (Pinney, 2005). Taylor made a lot of sparkling wine, which was easy to do with high-acid and low-sugar Concord grape juice. The firm grew from 1.25 million gallons of storage in 1940 to 27 million gallons in

1976 (*Wines & Vines Annual Directory*, various years). It was acquired by Coca-Cola in 1977, after which it opened a subsidiary in California. In 1993, Taylor was folded into the gigantic Canandaigua Wine Company, which is now known as Constellation Brands.

One of the largest mass-producer wineries is E&J Gallo, which was founded by brothers Ernest and Julio Gallo in Modesto, California, in 1933, just before Prohibition was repealed (Pinney, 2005, pp. 193, 197–203). This firm grew steadily through the 1930s and 1940s, from 200,000 gallons of storage in 1933 to 8.6 million gallons in 1950 (*Wines & Vines Annual Directory*, various years), by relying on bulk sales of wine to eastern wineries. In the 1950s, it expanded, partly through acquisition, and shifted away from bulk sales to marketing wine under its own label, most of it sweet or sparkling, in line with Americans' prevailing tastes. By 1990, storage was 330 million gallons. Facilitating Gallo's growth was the controlling interest it acquired in several distributors and its vertical integration into trucking, bottle-making, and aluminum caps. In contrast to Taylor, E&J Gallo was always concerned with making good wine (albeit at very low prices); to that end, it pushed growers to plant better grape varieties than the ubiquitous Thompson seedless and hired research chemists to improve winemaking techniques (Pinney, 2005, pp. 202–203). Starting in the 1960s, its production shifted to include more dry table wines, in response to shifts in consumer demand.

From the 1940s onward, increasing economies of scale led the mass-producer sector of the U.S. wine industry to consolidate; many small and medium-sized wineries were acquired by larger firms, often from outside the industry (Moulton, 1984). Gallo's growth through acquisition and Taylor's acquisition, first by Coca-Cola and then by Canandaigua, were typical. As a result, the number of mass-producer wineries declined almost continuously, from 309 in 1940, to a low of 175 in 1971, before rebounding somewhat during the 1980s. Despite the shrinking number of mass-producer wineries, industry sales continued to rise, reaching 441 million gallons in 1990. The largest firms – United Vintners, Guild, E&J Gallo, and Canandaigua – achieved most of these sales gains at the expense of smaller producers. As a result, the share of industry capacity held by the four largest firms increased from 23% in 1940 to 52% in 1990 (*Wines & Vines Statistical Survey*, various years).

Farm Wineries

These are small specialist wineries that have been labeled many different ways, as "farm," "boutique," "chateau," and "small" wineries. We follow

industry analysts (Adams, 1990; Pinney, 1989, 2005) and call this specialist form farm wineries. According to industry norms, farm wineries produce less than 50,000 cases of wine per year or have storage capacity of less than 100,000 gallons (Hiaring, 1976). Unlike the low-cost strategy adopted by mass producers, farm wineries increasingly came to rely on a differentiation strategy, which involves making wine from only a few grape varieties. Some produce small quantities of premium varietal wines, often from specific vineyards; others produce small quantities of distinctive but lower-quality wine for local consumption.

Mayacamas Vineyards is an exemplary early farm winery; it was founded by Jack and Mary Taylor in 1948 on Mount Veeder in the Mayacamas Mountains between the Napa and Sonoma Valleys. The firm produced small quantities of fine wines using Cabernet Sauvignon and Chardonnay grapes grown in its own vineyards; its storage capacity ranged between 5,000 and 6,000 gallons in the first decade, then rose to 15,000 gallons. In 1968, the winery was purchased by Robert and Elinor Travers, who expanded the winery to 50,000 gallons of storage by acquiring more land for vineyards; they also diversified the product base by adding Pinot Noir, Sauvignon Blanc, Merlot, and Cabernet Franc grapes to their mix. An exemplary more recent farm winery is Lenz Vineyard, which was founded in 1978 by Patricia and Peter Lenz on the North Fork of Long Island in New York. Like many Long Island wineries, Lenz makes wines from European grape varieties – Cabernet Sauvignon, Merlot, Chardonnay, Gewurztraminer, and Pinot Noir. Like Mayacamas, Lenz was small, with storage capacity of 18,000 gallons. As with the founders of Mayacamas, the founders of Lenz sold the winery, in 1988, to new owners who continued the tradition established by the founders.

Because most farm wineries are very small, owners and their families often supply most of the labor required for vineyard and winery operations. Most farm wineries do not possess mass producers' sophisticated research laboratories and production facilities. Instead, farm wineries assert the supremacy of vineyards, characteristic of the French doctrine of *goût du terroir*, which literally means "taste of the soil." This doctrine holds that only an appropriate match between climate, soil, and grape variety can produce superior wine. Perhaps the most striking difference between mass producers and farm wineries lies in their marketing strategies. Farm wineries target small upscale niches and seek to appeal to either discerning oenophiles across the country and abroad or adventurous tourists. Instead of using mass-media advertising like mass producers do, farm wineries rely primarily on word of mouth. Many use their tasting rooms and winery premises to

reach new customers. Farm wineries also celebrate differences in wine characteristics stemming from particular vineyards or vintages. In sum, farm wineries have a very different social code from mass producers: both their internal organization and their strategy differ from that of the generalist mass producers that are committed to large-scale production and place a premium on the consistency of their generic products (Swaminathan, 2001).

In 1940, there were 722 farm wineries. This number declined almost continuously, reaching a low of 141 in 1967. Many early farm wineries produced undifferentiated products for local markets, and their numbers declined due to increasing competition with the more-efficient mass-producer wineries. Starting in the 1960s, a new wave of farm-winery foundings fueled the rapid growth of this organizational form. By the beginning of 1990, there were 1,022 farm wineries, all but 31 founded after 1965. Thus, over time the industry partitioned into two distinct organizational forms, as small wineries were pressured by the consolidation of mass producers to differentiate their products. This strategic shift was facilitated by a swing in the public's taste for wine, away from high-alcohol, sweet wines and toward tart, lower-alcohol wines that more closely resembled old-world wine (Pinney, 2005).

Comparing the Two Forms

Despite their small numbers, mass producers have long been the dominant form of winery in the United States. Between 1940 and 1990, mass producers were on average 98 times as large as farm wineries: average storage capacity was 2.7 million gallons for mass producers and 30,000 gallons for farm wineries. And mass-producer wineries accounted for, on average, 98.4% of industry production, even though farm wineries often outnumbered mass producers. Fig. 1 plots the number of U.S. wineries between 1940 and 1989. Between 1940 and 1967, the number of wineries fell, primarily through the closure of farm wineries (shown in pale red), secondarily through acquisition of smaller mass producers by their larger rivals (shown in dark blue). After that point, the number of wineries rose rapidly, due to the proliferation of farm wineries.

DATA AND MEASURES

We gathered data on wineries in the United States between 1940 and 1989 from *Wines & Vines Annual Directories*. For every winery (bonded premise)

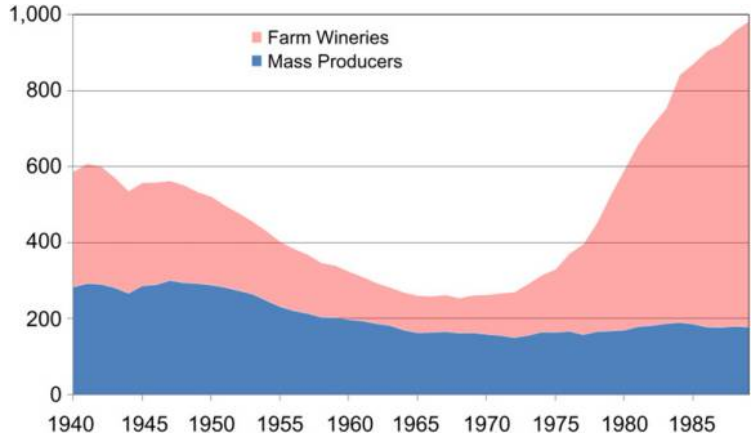

Fig. 1. The Evolving Number of Wineries.

every year, the *Directories* record winery name; city and state; year founded; size in terms of storage and fermentation capacity, as well as number of plants; vertical integration in terms of acres of vineyards owned, if any, and presence of bottling facilities; diversification in terms of number of brands and types of wine produced; farm-winery laws; and, central to our analysis, the names of key personnel (owners and employees), along with their titles. The directories list every single winery operating in the United States at the time of publication and the publisher verifies the listings with permits issued by the Bureau of Alcohol, Tobacco, Firearms and Explosives. Wineries self-report organizational features by responding to a standardized survey administered by *Wines & Vines*, the wine industry's leading trade publication. Wineries have a strong incentive to be accurate in reporting their personnel and other organizational data as the directory is widely used by industry participants, including suppliers and buyers, to conduct business.

Because the *Directories* list only key personnel, we see just the tip of the job-structure iceberg. This partial view is fine for our purposes, because the array of jobs in place at the top levels signals which competencies are considered most important and what is valued most across all levels in organizational hierarchies (Beckman & Burton, 2011). Moreover, variation in job-structure complexity at the top of organizational hierarchies is inevitably correlated with variation in structural complexity in the middle and bottom, and because the set of functions delineated at the top is correlated

with the breadth of functional specialization in the middle and bottom (Zorn, 2004). Moreover, the tests of our hypotheses will be conservative because variation in job-structure complexity is constrained by the small number of jobs we observe. Conversations with the *Directory's* publisher revealed that wineries can list whomever they wish, so the lists of personnel and titles might be signals to the wine field rather than reflections of actual operations. That is fine for our purposes because we seek to know how organizations signal that they meet expectations about form-based identities.

Measures of Dependent Variables

To assess the division of labor, we analyze two related outcomes: the number of distinct job titles in each winery and the number of functions delineated by those job titles. Thus, we focus on the horizontal division of labor and ignore the vertical division of labor. We take this approach because most of the organizations we study are small, so their job structures have little hierarchy.

To create these dependent variables, we began by coding job titles exactly as recorded in the *Directories*, creating one observation per job title per person per winery per year. If two or more people in a winery had the same job title in a year, we entered each person separately into our database as a holder of that job. If one person in a winery had two or more job titles in a year, we created one record for each job title. If one person worked for two or more wineries in a year, we created one record for each position. After entering job titles into our database exactly as they appeared in the *Directories*, we imposed a uniform coding scheme to reconcile occasional inconsistencies in spelling and format.

Our data include 593 distinct job titles. Table 1A lists the 15 most common job titles and notes the number of times each was used by mass producers and farm wineries, revealing obvious differences between the two winery forms. While the job title "owner" was the most common one in both forms of winery, it constituted one-third of all job titles for farm wineries, but only one-eleventh for mass producers. Winemakers, vineyard managers, and partners were more common in farm wineries, while presidents, vice presidents, general managers, treasurers, sales managers, and office managers were more common in mass producers. A total of 500 distinct job titles were used by mass producers, and 202 distinct job titles were used by farm wineries. Table 1B lists 10 examples of job titles that are rare in each form of winery.

Table 1A. 15 Most Common Job Titles in Each Winery Form.

Mass Producers			Farm Wineries		
Job title	No. obs.	% Obs.	Job title	No. obs.	% Obs.
President	7,206	11.3	Owner	17,736	32.8
Winemaker	6,655	10.4	Winemaker	7,310	13.5
Owner	5,924	9.28	President	4,660	8.62
Vice president	5,441	8.53	Secretary	3,557	6.58
General manager	5,152	8.07	General manager	3,182	5.8
Secretary	5,046	7.91	Vineyard manager	3,130	5.79
Treasurer	4,304	6.74	Vice president	2,929	5.41
Sales manager	3,282	5.14	Treasurer	2,564	4.74
Chemist	2,622	4.11	Sales manager	2,002	3.70
Vineyard manager	1,941	3.04	Partner	1,517	2.80
Office manager	1,216	1.91	Chemist	614	1.14
Chairman	873	1.37	Chairman	509	0.94
Bottling superintendent	851	1.33	Office manager	322	0.60
Partner	772	1.21	General partner	307	0.57
Plant manager	677	1.06	Assistant winemaker	258	0.48
Total observations	63,824		Total observations	54,092	

Table 1B. 10 Rare Job Titles in Each Winery Form.

Mass Producers		Farm Wineries	
Job title	No. obs.	Job title	No. obs.
Brandy maker	1	Consulting viticulturist	1
Lab. director	1	Wine shop manager	1
Training manager	1	Special events manager	1
Employee relations director	2	Agriculture advisor	2
Bottling VP	5	Plant physiologist	2
Plant foreman	4	Executive chef	3
Brandy compounder	5	Nursery manager	4
Direct marketing vice president	6	Vineyard director	6
Legal affairs manager	7	Bookkeeper	6
R&D vice president	9	Chef	9
Publicity director	13	Retail sales	14

After standardizing job titles, we coded areas of functional specialization, in two stages. First, we coded five general functions: corporate governance, general administration, finance and control, sales and marketing, and production. Second, we coded 37 specific functions within these general functions. In both stages of coding, our decisions were based on the content

of job titles. The general function "marketing and sales," for example, includes eight specific functions: advertising, hospitality, marketing, merchandising, packaging, purchasing, sales, and service. Table 2 lists the specific functions associated with each general function, and the number of annual records on each. Note that three job titles (broker, agent, and operator), which appeared in a total of 17 annual records, were so vague that we were unable to code general function. In addition, some job titles in the corporate governance general administration, and production general functions were not precise enough to allow us to code a specific function. For example, the job title *foreman* has the general function Production but no specific function; similarly, the job title *general manager* has the general function General Administration but no specific function. Not surprisingly, the vast majority of imprecise job titles were in general administration. Our analysis of the division of labor focuses on specific functions rather than general functions because there is greater variation, both cross-sectionally and longitudinally, in the number of specific functions, and so more empirical leverage.

Next, we aggregated data to the firm-year level of analysis. The *Directories* often recorded data for subsidiaries separately from their parent firms. We first merged data on subsidiaries into data on parent firms. Then for each firm in each year, we counted the *number of distinct job titles* and the *number of (specific) functions* among the reported job titles.

Distinguishing between Winery Forms

Following industry norms, we defined as mass producers all firms producing more than 50,000 cases of wine per year or having storage capacity of more than 100,000 gallons (Hiaring, 1976). We define as farm wineries all firms that were smaller than both of these limits at founding. After founding, some farm wineries expanded beyond those size limits, especially in California and Washington, states that have no farm-winery laws. This suggests that size is sometimes a cognitive-cultural, rather than coercive-legal, marker of the farm-winery form.

Measures of Independent Variables: Category Prototypes

Our dependent variables are counts: the number of job titles and specific functions in each winery. In keeping with cognitive-psychological research

Table 2. General and Specific Functions by Winery Form.

General Function	Specific Function	No. Obs. MP	No. Obs. FW
Corporate governance	Board of directors	1,589	534
	Founder	5	1
	Lessor	–	18
	Officer	192	112
	Owner	5,943	17,932
	Partner	875	1,986
	Not specified	17	–
Finance/control	Accounting	82	12
	Controller	563	37
	Finance	218	33
	Secretary	5,677	3,578
	Treasurer	4,614	2,573
General administration	Administration	1,434	379
	Consulting	18	82
	Human relations	23	1
	Legal	74	103
	Planning	13	–
	Technical	50	6
	Not specified	19,671	11,288
Marketing/sales	Advertising	163	21
	Hospitality	28	58
	Merchandising	14	–
	Marketing	604	211
	Packaging	22	–
	Public relations	305	144
	Sales	4,190	2,161
	Service	37	–
Production	Distribution	125	2
	Grape growing	2,314	3,256
	Logistics	12	–
	Plant	3,188	409
	Purchasing	660	124
	Quality control	136	5
	Research and development	165	11
	Spirits	24	–
	Wine cellar	190	204
	Winemaking	7,391	7,877
	Wine science	2,962	840
	Wine management	218	76
	Not specified	9	2
No general function	Not specified	3	14

showing that the central tendency is the best yardstick for category prototypes (Barsalou, 1985), we calculated the *mean number of job titles* and the *mean number of functions* among wineries in each winery's state, apart from the focal winery. We used states to bound winery populations because states are highly salient boundaries in the wine industry, so wineries' identities are state-centered: wine labels list state of origin; wineries are often active in state industry associations that co-operate to promote tourism and lobby governments for favorable legislation; and wholesalers, retailers, and critics distinguish between wines from different states, so consumers do the same. In addition, many aspects of wineries' operations – for instance, whether they may ship directly to retailers in other states, or must go through wholesalers – depend on regulations in their headquarters state.

Our measures of category prototypes are idiosyncratic to each winery-year observation. In the analysis of mass producers, means for mass producers were calculated after excluding the focal winery and means for farm wineries were calculated using data on all farm wineries in the state. In the analysis of farm wineries, means for farm wineries were calculated after excluding the focal winery and means for mass producers were calculated using data on all mass producers in the state. Means for the focal winery's form are not defined when the focal winery is the only one of its form in that state in that year, so those observations dropped out of the analysis.

Measures of Moderators: Institutional Mandates for Organizational Forms

In the wine industry, one set of institutional rules stands out as critical in defining form-based social codes: farm-winery laws. Between 1968 and 1990, 24 of the 43 states in which wineries operated passed farm-winery laws to encourage the establishment of farm wineries.[3] All farm-winery laws are aimed at supporting farm wineries, generally by granting them privileges denied to mass producers. Most allow farm wineries to sell directly to consumers on their premises, so farm wineries do not have to try to sell through distributors or warehouses, which would cut into their often-slim profit margins, if indeed these large middle men would even agree to carry the small quantities of wine that most farm wineries produce. Passage of these laws has helped farm wineries thrive, often in places where commercial winemaking had never been successful in the past; for instance, in Virginia or on Long Island in New York.

Most state-level farm-winery laws draw clear distinctions between the mass-producer and farm-winery forms by specifying size limits for farm wineries, typically 100,000 gallons or less. Importantly, these laws are silent with respect to the internal organization and operation of farm wineries, so they allow wineries to claim the farm-winery form even if they do not use the job titles and functional labels that are common among farm wineries. Basically, farm-winery laws divert attention away from internal organization toward direct distribution and scale of operations.

We measured the existence of a *farm-winery law* with a dummy variable set equal to one the year after such a law was put into effect in the focal state and zero before. Data on these laws came from the description in the *Wines & Vines Annual Directories*, from Adams (1990), and from correspondence with state alcoholic beverage commissions. We then interacted this dummy with the mean numbers of job titles and functions among farm wineries in the focal farm winery's state in the focal year.

Measures of Moderators: Within-Form Variation

While wineries can easily be classified as mass producer or farm wineries, there was substantial variation among both forms on job-structure complexity, but some times and places saw less variation than others. For instance, in 1956, the number of job titles held by the key personnel of mass-producer wineries in Arkansas ranged from one to three; among mass producers in California, the range was from one to twenty-seven. Similarly, in 1956 in Arkansas, the number of specific functions denoted by those job titles ranged from one to three, while in California, the range was from one to twelve. Farm wineries also showed variation in job-structure complexity. For instance, in Connecticut in 1980, the number of job titles in farm wineries ranged from one to five, while in Pennsylvania, the range was one to ten. In 1980, the number of specific functions in farm wineries ranged between one and four in Connecticut, and between one and six in Pennsylvania.

To investigate the effects of variation in job-structure complexity among the organizations in each form, we began by calculating the *standard deviation of the number of job titles and functions* for mass producers and farm wineries separately. Similar to our calculation of means, we calculated idiosyncratic standard deviations for each winery-state-year observation. And similar to our calculation of means, we excluded the focal winery in our calculation for the focal winery's own form, and we

included all wineries of the other form in our calculation for the other form. Standard deviations are not defined when there is only one winery of the focal winery's form in the state in that year (the focal winery itself) and when there is only one winery of the other form in the state in that year, so those observations dropped out of the analysis. We then interacted the means and the standard deviations. Because the resulting interaction terms were generally quite large for mass producers, we scaled mass-producer interactions by 10 to facilitate comparison of effect estimates.

We created a second measure, *the Jaccard index of similarity in job titles and functions* (Jaccard, 1901). This is more a nuanced measure than the standard deviation because it considers similarity among wineries in the content of their job structures, not just their degree of complexity. That is, it takes the *names* of the titles or functions into account, not just the *number* of titles or functions. To create this index, we started with a dyadic measure, using the formula below:

$$\text{Jaccard index}_{ijst} = \frac{x_{ijst}}{x_{ist} + x_{jst} - x_{ijst}}$$

where x_{ijst} is the number of job titles (or functions) shared by firms i and j (in state s in year t), x_{ist} is the number of job titles (or functions) in firm i, x_{jst} is the number of job titles (or functions) in firm j. This dyadic measure is basically the ratio of shared titles (or functions) to the total number of titles (or functions), shared and not shared. We then aggregated this dyadic measure to the state-year level to calculate the average pair-wise similarity among all wineries of a particular form in a particular state in a particular year:

$$\text{Jaccard index}_{st} = \sum_{i,j \neq i} \frac{\text{Jaccard index}_{ijst}}{n}$$

where n is the number of paired comparisons, which equals $N(N-1)/2$, where N is the number of wineries of the focal form in state s in year t. We then interacted the Jaccard indices with the mean numbers of job titles and functions for wineries with a particular form in a particular state and year.

Measures of Moderators: Age and Size

We measured *age* as years since founding, as proxied by years since first appearance in the *Wines & Vines Annual Directories*. We expect the effects of age to be nonlinear, as the difference between firms that are one and five years old should be greater than the difference between firms that are 30 and 35 years old, so we logged age. Following other studies of the U.S. wine industry (Delacroix & Solt, 1988; Delacroix, Swaminathan, & Solt, 1989; Swaminathan, 1995, 2001), we measured *size* in two ways. First, we measured storage capacity in thousands of gallons. The distribution of this variable was right-skewed – there were many small wineries and a few large ones – so we logged it. Second, we counted the number of plants, to capture the extent to which wineries were divided into distinct operating units. To assess the moderating effects of age and size on wineries' propensities to resemble other wineries, we created two sets of interaction variables. For both outcomes, we multiplied the mean numbers of job titles and functions for wineries with a particular form in a particular state and year by winery age and size. We logged both age and size (storage capacity) because their distributions are right-skewed.

Measures of Control Variables[4]

We controlled for several variables that have been shown to influence job-structure complexity. Since age and size are moderators, we included in our analyses the main effects of these variables. This is essential because much previous research shows that these variables affect job structures. With regard to *age*, older organizations are more formalized and bureaucratic than young ones, which promotes complexity in job structures (Meyer & Brown, 1977). In addition, employees of older organizations have had more time than employees of younger organizations to find opportunities to advance their careers through idiosyncratic job redefinition and expansion (Miner, 1987; Miner & Estler, 1984), which can increase the variety of jobs and functional specialties in older organizations. For its part, *size* has a positive relationship with the complexity of organizations' job structures (e.g., Blau & Schoenherr, 1971; Hall, Haas, & Johnson, 1967; Pugh et al., 1969).

Diversified organizations have to perform a wider array of tasks to create multiple products or serve many types of customers in multiple locations than do single-product, single-customer, or single-location

organizations. As the variety of organizational products, customers, or locations increases, the division of labor becomes more fine-grained. Because they focus on producing high-quality wines for elite consumption or distinctive wines for local consumption, farm wineries compete primarily by differentiating their products; in contrast, mass producers compete more on price (Stuller & Martin, 1989). Therefore, we expect diversification, specifically, the branding of distinctive products, is a critical strategic action for farm wineries, so it should affect their job structures. Following previous studies of the U.S. wine industry (Swaminathan, 1995, 2001), we measured the extent of diversification in two ways, with number of brands and number of product categories.

As organizations become more *vertically integrated*, the division of labor becomes more complex, because organizations have to perform a wider array of tasks. The tasks required to acquire or create inputs to their production processes differ from the tasks involved in transforming inputs into end products, and from those involved in selling and servicing products. As a result, organizations create a broader set of jobs and in a wider array of functions as they integrate upstream or downstream. We measured upstream integration as the total acreage of vineyards in millions of acres. We measured downstream integration using a binary variable indicating whether or not a winery had a bottling line – that is, whether the winery possessed the facilities to bottle, label, and crate the wine it produced, or had to send its wine out to be packaged. Bottling facilities do not just indicate vertical integration; they also allow wineries greater control over their production processes, which is critical for wineries that seek to produce the highest-quality wines.

We controlled for the *cumulative number of acquisitions* made by each winery, because we reasoned that growth through acquisition might lead to the development of more elaborate job structures than internal growth. (Our data are left-truncated at 1940. So for those wineries that were alive in 1940, we count only acquisitions made from 1940 onward.) Our final controls are *the number of wineries in the state with each form*, excluding the focal winery. This gauges the extent to which the local industry is highly structured (DiMaggio & Powell, 1983).

We created a time scale, *calendar year*, to remove the influence of secular trends not included in our models. This is important because many variables increased monotonically throughout the 50 years we study wineries.

The *Directories* covered all 2,940 wineries that operated in the United States between 1940 and 1989, which yielded a total of 31,300 annual observations. Data were missing on size, horizontal diversification, and

vertical integration for some wineries in some years. After eliminating *Directory* records with missing data, dropping observations on one outlier (a mass producer with huge acreage), dropping records where there were not enough wineries to calculate mean number of job titles and functions, and lagging independent variables one year to ensure temporal priority, we were left with 9,791 annual observations on 574 mass-producer wineries and 12,229 annual observations on 1,267 farm wineries.

METHODS OF ANALYSIS

Both outcomes of interest are counts: the number of job titles and functions in each winery each year. Accordingly, we analyzed both outcomes using event-count methods (Cameron & Trivedi, 1986), in which the dependent variable was the number of job titles (or specific functions) in a winery in a year. The unit of analysis was the firm-year, and we have multiple observations on each firm over time. It is important to include firm fixed effects because we want to capture the effects of the variables of interest on variation in the number of job titles and functions within each firm over time. In other words, we want to model growth and decline in the number of job titles and functions *within* each firm.

There are two options available to estimate event-count models with fixed effects over panel data: fixed-effects negative-binomial models (Hausman, Hall, & Griliches, 1984) and fixed-effects Poisson models (Wooldridge, 1999). The former allow for over dispersion, which occurs when the variance on the dependent variable exceeds the mean, through the inclusion of an additional variance parameter (Cameron & Trivedi, 1990). But such models also have two disadvantages, which outweigh this advantage. First, they produce inconsistent maximum likelihood estimates if the underlying distributions are misspecified; that is, if the dependent variables do not follow negative-binomial distributions. Second, the firm-specific differences are captured in the over-dispersion parameters. It is desirable for the firm-specific fixed effects to influence the means on our dependent variables, just as in fixed-effects linear regression, rather than the variances. Accordingly, we use fixed-effects Poisson models, which are designed to capture firm-specific effects in this manner. Such models produce consistent quasi-maximum likelihood estimates under more general conditions than fixed-effects negative-binomial models and, hence, are more robust to misspecification (Wooldridge, 1999). In addition, they are robust in

the presence of arbitrary dependence between observed independent variables and the unobserved component. For all models, we computed robust standard errors, as recommended by Wooldridge (1999), using Simcoe's (2008) xtpqml command for Stata.

RESULTS

Descriptive Statistics

Fig. 2 plots the average number of job titles and functions for mass producers and farm wineries. Job titles are the solid line, functions the dotted line. For mass producers, both statistics grew steadily from the 1940s to the 1960s, then leveled out in the 1970s and declined slightly in the 1980s; for farm wineries, both statistics rose rapidly during two time periods – the 1940s and the mid-1960s to the late 1970s – and were either level or declining slightly at other times.

Table 3 presents univariate statistics for the variables in our multivariate models. This table is divided into two parts: Table 3A analyzes mass-producer wineries, while Table 3B analyzes farm wineries. The correlations, which we do not show here to save space, generally support our hypotheses. Few of the correlations are high. For mass producers, these correlations were above 0.5: between size (storage) and number of titles, between the two size measures, between size (number of plants) and the acquisition dummy, and between the year variable and the category prototypes. For farm wineries, only the correlations between the year variable and the category prototypes were above 0.5, except, of course, among the interaction terms that test the contingent effects of form-based constraints. Therefore, multicollinearity is unlikely to inflate standard errors or bias parameter point estimates.

Multivariate Analyses

Mass Producers

Table 4 analyzes mass-producer wineries. The dependent variable in models 1–3 is the number of job titles; in models 4–6, it is the number of functions. To save space, we do not report coefficients on the many control variables. The appendix shows baseline (control-variable-only) models.

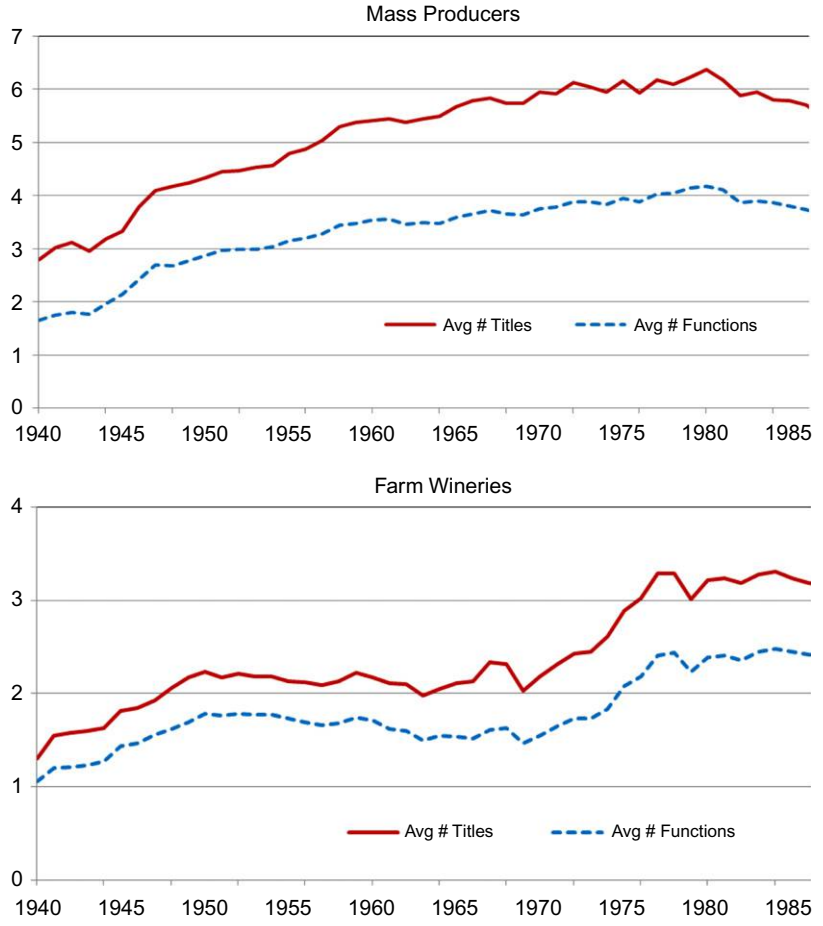

Fig. 2. Average Number of Job Titles and Functions.

Models 1 and 4 show that the job structures of mass-producer wineries were affected by those of other mass producers in their state: in both models, coefficients on the mass-producer-based category prototypes (the average number of job titles and functions among other mass producers in the state) are positive and statistically significant. This result supports hypothesis 1a. These effects however, are not very large.[5] For number of job titles, an increase in the mass-producer category prototype from the mean to one standard deviation above the mean corresponds to a 4.1% increase in job

Table 3A. Descriptive Statistics for Mass-Producer Wineries.

Variable	Mean	Std. Dev.	Minimum	Maximum
DV: number of job titles	4.99	3.76	0	48
DV: number of specific functions	3.22	2.40	0	22
Category prototype (number of titles)$_{MP}$	4.95	1.34	.857	14.5
Category prototype (number of titles)$_{FW}$	2.22	.919	0	7
Category prototype (number of functions)$_{MP}$	3.19	.889	.857	8.5
Category prototype (number of functions)$_{FW}$	1.71	.576	0	5
Variation (number of titles)$_{MP}$	12.1	7.03	0	72.3
Variation (number of functions)$_{MP}$	4.86	2.53	0	30.3
Jaccard (number of titles)$_{MP}$	.242	.060	0	.833
Jaccard (number of functions)$_{MP}$	.297	.065	0	1
Ln(size) (storage, gallons)	13.1	1.63	7.60	19.6
Ln(age) (years)	2.60	.919	0	4.04
Farm-winery law (yes = 1)	.032	.175	0	1
Number of plants	1.79	1.60	1	23
Diversification: number of brands	2.31	2.70	0	45
Diversification: number of products	2.73	1.54	1	7
Vertical integration: vineyards (10^3 acres)	.358	3.42	0	85.0
Vertical integration: bottling line (yes = 1)	.642	.480	0	1
Calendar year	1962	14.8	1940	1989
Cumulative number of acquisitions	.203	.663	0	8
Number of mass producers in the state/100	.230	.169	.003	.597
Number of farm wineries in the state/100	.110	.069	.002	.199

Notes: These statistics were calculated on 10,457 annual observations of 632 U.S. mass-producer wineries operating between 1940 and 1989, inclusive. The subscript MP refers to mass producers in the same state as the focal firm; the subscript FW, to farm wineries in the same state as the focal firm. Category prototypes, variations, and Jaccard indices are state-level variables; that is, they include the focal winery.

Table 3B. Descriptive Statistics for Farm Wineries.

Variable	Mean	Std. Dev.	Minimum	Maximum
DV: number of job titles	2.66	2.03	0	13
DV: number of specific functions	2.02	1.43	0	9
Category prototype (number of titles)$_{MP}$	5.15	1.49	0	21
Category prototype (number of titles)$_{FW}$	2.51	.859	0	6.33
Category prototype (number of functions)$_{MP}$	3.31	.985	0	13
Category prototype (number of functions)$_{FW}$	1.91	.576	0	4.5
Variation (number of titles)$_{FW}$	3.06	1.71	0	1.78
Variation (number of functions)$_{FW}$	1.54	.872	0	8.81
Jaccard (number of titles)$_{FW}$	.359	.156	0	1
Jaccard (number of functions)$_{FW}$	.389	.143	0	1
Ln(size) (storage, gallons)	9.73	1.19	4.61	12.4

Table 3B. (*Continued*)

Variable	Mean	Std. Dev.	Minimum	Maximum
Ln(age) (years)	1.93	.955	0	4.03
Farm-winery law (yes = 1)	.118	.323	0	1
Number of plants	1.02	.166	1	3
Diversification: number of brands	1.30	1.30	0	13
Diversification: number of products	1.61	.908	0	6
Vertical integration: vineyards (10^3 acres)	.024	.047	0	.750
Vertical integration: bottling line (yes = 1)	.476	.499	0	1
Calendar year	1970	16.9	1940	1989
Cumulative number of acquisitions	.005	.071	0	1
Number of mass producers in the state/100	.240	.213	.003	.597
Number of farm wineries in the state/100	.082	.071	.001	.199

Notes: These statistics were calculated on 13,838 annual observations of 1,459 U.S. farm wineries operating between 1940 and 1989, inclusive. The subscript MP refers to mass producers in the same state as the focal firm; the subscript FW, to farm wineries in the same state as the focal firm. Category prototypes, variations, and Jaccard indices are state-level variables; that is, they include the focal winery.

titles; for number of functions, a similar-magnitude increase yields a 4.7% increase in functions.

As expected, mass producers were not affected by farm wineries, as the coefficients on the farm-winery category prototypes (the average number of job titles and functions among farm wineries in the state) are not strong: only marginally significant in one model and non-significant in the other. We drop this variable from all later models.

Models 2 to 3 and 5 to 6 examine whether structural dissimilarity (or similarity) within the mass-producer form attenuates (or accentuates) the impact of category prototypes. Models 2 and 5 use the measure of dissimilarity based on the standard deviation of the mass-producer category prototype variable. They show that structural divergence among mass producers dampens their tendency to resemble each other: interactions between variation and category prototype have negative and statistically significant effects on both outcomes. These results support hypothesis 3. The dampening effects are moderate in size. For job titles, holding constant the category prototype, a one standard deviation increase in variation reduces job titles by 8.7%. For job functions, a similar-magnitude increase in variation, again holding constant the category prototype, yields a much larger reduction of 20.2%.

Table 4. Models of Job Structure for Mass-Producer Wineries.

Model Number	1	2	3	4	5	6
Dependent Variable	Number of Job Titles			Number of Functions		
Ln(size) (storage)	.150***	.303***	.292***	.151***	.233***	.224***
	(.028)	(.049)	(.047)	(.029)	(.050)	(.049)
Ln(age)	.027	.093	.162**	.066	.189**	.288***
	(.045)	(.064)	(.057)	(.050)	(.069)	(.065)
Category prototype$_{MP}$	.030*	.459***	.418***	.052*	.528***	.478***
	(.013)	(.098)	(.013)	(.020)	(.125)	(.139)
Category prototype$_{FW}$	.0035†			.041		
	(.020)			(.028)		
Variation$_{MP}$		.010**			.040*	
		(.003)			(.018)	
Category prototype$_{MP}$ × Variation$_{MP}$/10		−.013**			−.089†	
		(.004)			(.046)	
Jaccard Index$_{MP}$			−.326			−.330
			(.279)			(.256)
Category prototype$_{MP}$ × Jaccard Index$_{MP}$			.119*			.148†
			(.049)			(.078)
Category prototype$_{MP}$ × ln(size)		−.028**	−.025***		−.023*	−.019†
		(.007)	(.007)		(.011)	(.011)
Category prototype$_{MP}$ × ln(age)		−.018	−.033**		−.052**	−.080***
		(.013)	(.011)		(.020)	(.018)
Wald χ^2	391.6	473.2	481.0	359.7	391.6	378.1

Notes: This table presents firm fixed-effects Poisson regression analyses of 9,791 annual observations on 574 mass-producer wineries in the United States between 1941 and 1989, inclusive. The dependent variable in models 1–3 is the number of job titles; in models 4–6, the number of functions. The subscript MP refers to other mass producers in the same state as the focal mass producer; the subscript FW, to farm wineries in the same state as the focal mass producer. All models include control variables, which are not reported to save space: number of plants, diversification (number of brands and product lines), vertical integration (vineyard acreage and having a bottling line), a dummy for the existence of a farm-winery law in the state, calendar year, cumulative number of acquisitions, number of mass-producer wineries in the state apart from the focal winery, and number of farm wineries in the state. Robust standard errors, which are in parentheses below parameter estimates, were clustered by winery.

$\dagger p < .10$, $*p < .05$, $**p < .01$, and $***p < .001$, two-tailed t tests. (M4: $\dagger p = .054$; M6: $\dagger p = .058$ for category prototype × Jaccard, $p = .065$ for category prototype × size.)

Models 3 and 6 use the alternative measure: the Jaccard index of similarity. Where and when mass producers shared a large fraction of job titles and functional designators, they tended to resemble each other more: interactions between the Jaccard index and the category prototype have positive and statistically significant effects on both outcomes (marginally significant in model 6 at $p = .058$). These results provide further support for hypothesis 3. These effects are tiny, perhaps because the Jaccard index is less variable than the number of job titles or functions. For job titles, holding constant the category prototype, a one standard deviation increase in the Jaccard index increases job titles by 0.72%. For job functions, a similar increase, again holding constant the category prototype, yields an increase of 0.97%.

Models 2 to 3 and 5 to 6 also investigate the moderating effects of size and age, by including interactions between the category prototype and the focal winery's size and age. Both larger size and greater age made mass-producer wineries resemble other wineries less strongly. All four interactions with size are negative; three are statistically significant and one is marginally significant ($p = .065$). And all four interactions with age are negative; three are statistically significant and one is non-significant. These findings are consistent with hypotheses 4a and 5. The effects are small. Across all four models, holding constant category prototype, the average change in the multiplier associated with one standard increases from the mean (logged) age and size are 3.8% for size and 4.3% for age.

Farm Wineries

These results are shown in Table 5, which is set up parallel to Table 4. Again, to save space, we do not report coefficients on the many control variables. The appendix shows baseline (control-variable-only) models. As expected, farm wineries were influenced by other farm wineries in the state. In models 1 and 5, coefficients on the farm-winery category prototypes (the mean number of job titles or functions) are positive, as predicted, and statistically significant. These results support hypothesis 1b. For job titles, a one standard deviation increase from the mean farm-winery category prototype is associated with a 6.2% increase in job titles. For job functions, a similar-magnitude increase is associated with a 5.4% increase in functions. Farm wineries appear to be little influenced by mass-producer wineries in the state: although both coefficient on the mass-producer category prototypes (the average number of job titles and functions in mass-producer wineries) are positive, as predicted, only one is statistically significant. For both outcomes, these coefficients are smaller than those on the coefficients

Table 5. Models of Job Structure for Farm Wineries.

Model Number	1	2	3	4	5	6	7	8
Dependent Variable	Number of Job Titles				Number of Functions			
Ln(size) (storage)	.139***	.137***	.124†	.123†	.106***	.103***	.066	.063
	(.027)	(.027)	(.065)	(.066)	(.025)	(.025)	(.063)	(.063)
Ln(age)	.019	.019	.122†	.108	.011	.009	.165*	.145†
	(.040)	(.039)	(.067)	(.068)	(.038)	(.038)	(.078)	(.077)
Farm-winery law (yes = 1)	.018	.373**	.403**	.381**	−.014	.433**	.511***	.428**
	(.057)	(.125)	(.131)	(.131)	(.067)	(.138)	(.134)	(.148)
Category prototype$_{FW}$	.070***	.084***	.146	.064	.091**	.124***	.204	−.029
	(.021)	(.023)	(.184)	(.189)	(.031)	(.035)	(.241)	(.237)
Category prototype$_{MP}$	.009				.028*			
	(.007)				(.013)			
Category prototype$_{FW}$ × Farm-winery law		−.122**	−.129**	−.122**		−.214***	−.244**	−.199**
		(.042)	(.043)	(.043)		(.065)	(.062)	(.069)
Variation$_{FW}$			.035*				.082**	
			(.017)				(.029)	
Category prototype$_{FW}$ × Variation$_{FW}$/10			−.101*				−.042***	
			(.049)				(.011)	
Jaccard Index$_{FW}$				−.270				−.582**
				(.177)				(.211)
Category prototype$_{FW}$ × Jaccard Index$_{FW}$				.154†				.353**
				(.092)				(.125)
Category prototype$_{FW}$ × ln(size)			.004	.005			.018	.020
			(.020)	(.020)			(.025)	(.025)
Category prototype$_{FW}$ × ln(age)			−.042*	−.037†			−.086**	−.076*
			(.020)	(.020)			(.032)	(.031)
Wald χ^2	216.0	224.3	223.3	227.1	163.4	164.8	178.8	175.4

Notes: This table presents firm fixed-effects Poisson regression analyses on 12,229 annual observations of 1,267 farm wineries in the United States between 1941 and 1989, inclusive. The subscript MP refers to mass producers in the same state as the focal farm winery; the subscript FW, to other farm wineries in the same state as the focal farm winery. All models include control variables, which are not reported to save space: number of plants, diversification (number of brands and product lines), vertical integration (vineyard acreage and having a bottling line), calendar year, cumulative number of acquisitions, number of farm wineries in the state apart from the focal winery, and number of mass-producer wineries in the state. Robust standard errors, which are in parentheses below parameter estimates, were clustered by winery.

† $p < .10$, *$p < .05$, **$p < .01$, and ***$p < .001$, two-tailed t tests. (M3: †$p = .088$ for category prototype × Jaccard, $p = .057$ for category prototype × age.)

for farm-winery category prototypes. These results partially support hypothesis 1c. For job functions, a one standard deviation increase in the mass-producer category prototype is associated with a 2.8% increase in job functions. Because its effects are inconsistent across outcomes and we are mainly interested in interactions with the farm-winery category prototype, we dropped this variable from later models.

Models 2 and 6 show that when there is a farm-winery law in the focal winery's state, farm wineries resemble each other less: both interactions between the dummy for farm-winery law and the category prototype have negative and statistically significant effects. These results support hypothesis 2 and indicate that farm-winery laws institutionalized a category – farm winery – that lacked specific codes for internal structures, thus allowing farm wineries greater latitude in job structures. Holding constant category prototype, wineries in states with farm-winery laws had 12% fewer job titles and 19% fewer functions than wineries in states without such laws.

Models 3 and 7 reveal that structural divergence among farm wineries dampens isomorphism: both interactions between variation and category prototype are negative and statistically significant. These results support hypothesis 3. For job titles, holding constant the category prototype, a one standard deviation increase in variation reduces job titles by 16%. For job functions, a similar-magnitude increase in variation, again holding constant the category prototype, yields a much smaller reduction of 3.6%.

Models 4 and 8 use the alternative measure: the Jaccard index of similarity. Where and when mass producers shared a large fraction of job titles and functional designators, they tended to resemble each other more: both interactions between the Jaccard index and the category prototype have are positive; one is statistically significant, the other marginally significant ($p = .088$). These results provide further support for hypothesis 3. These effects are small. For job titles, holding constant the category prototype, a one standard deviation increase in the Jaccard index increases job titles by 2.4%. For job functions, a similar increase, again holding constant the category prototype, yields an increase of 5.2%.

Models 3 to 4 and 7 to 8 also investigate the moderating effects of size and age. Although larger size did not make the job structures of farm wineries more likely to reflect the structural complexity of other farm wineries, greater age made the job structures of farm wineries less likely to reflect that complexity. All four interactions with farm-winery size were positive as expected, but none were statistically significant. All four interactions with age were negative; three were statistically significant and one was

marginally significant ($p = .057$). Taken together, these results offer no support for hypothesis 4b but strong support for hypothesis 5. Holding constant category prototype, the average decrease in the multiplier associated with a one standard increase from the mean (logged) size is 3.7% for job titles and 7.4% for functions.

Robustness Check

We checked the sensitivity of our analysis to our model specification. We estimated negative-binomial models without firm fixed effects (because of the concerns we raised above about fixed-effects negative-binomial models) and included the lagged (prior-year) value of the dependent variable. This specification models a growth process: change over time in the number of titles or functions, and explicitly captures the fact that current size depends on past size (Heckman & Borjas, 1980). These results largely parallel the results shown here.

CONCLUSION

This paper has examined how employing organizations arrange their tasks and label their employees' jobs; in particular, how complex job structures are, as revealed by the number of distinct job titles used and the number of functions delineated by those titles. Our analysis extends previous research on job structures by highlighting how organizational forms affect job structures, and so highlights the interplay between internal (technical) and external (cultural) causal forces. Organizational forms are abstract, socially constructed categories into which observers fit particular organizations in order to evaluate them (Hannan et al., 2007; Zuckerman, 1999). Our focus on organizational forms as categories yielded four novel conclusions about job structures. First, like many other social categories, organizational forms often emerge as observers interact and develop a consensus about what the form is and is not. Our research shows that such social construction generates powerful cognitive schemas and normative expectations that drive form-specific isomorphism in job structures. Second, our analysis demonstrates that when institutional rules mandate membership in a form based on outputs or processes but not on internal structures, tendencies toward form-based isomorphism are weakened. For the wine industry, the key institutional rule is the farm-winery law. When and where a farm-winery law had been passed, farm wineries were less likely to be affected by the job

structures of other nearby farm wineries. Third, our analysis shows that form-specific isomorphic pressures are weakened by variation among form members, which renders form categories especially fuzzy in the minds of observers. Finally, our research makes clear that form-based constraints' place on job structures depends on the legitimacy and material resources garnered by organizations of varying ages and sizes.

This last point advances research on organizational forms as categories: it shows that all organizations with a particular form are not equally affected in all circumstances by violations of or adherence to that form's social code. The impact of the job structures of other nearby organizations that are considered when constructing category prototypes is moderated by two important characteristics of organizations (size and age) in ways that are generally consistent with organizations' form-based identities. Larger generalist organizations, whose social codes valorize the large size needed to realize economies of scale, are less affected by what other generalists look like than are smaller generalist organizations. But contrary to our expectations, smaller specialist organizations, whose social codes valorize being small and focusing on a narrow niche, are generally not less affected by what other specialists look like than are larger ones. Moreover, older organizations, both generalists and specialists, are less affected by what other organizations look like than are their younger counterparts because all older organizations are buffered by their greater legitimacy and material resources from coercive and normative pressures to adopt the structures appropriate to their form.

In conclusion, much work remains to be done to bring to fruition the promise latent in Baron's (2004) call to study organizational forms in terms of labor market identities or codes. One extension of this study could involve how form social codes become sharper or fuzzier resulting from the patterns of labor or more specifically managerial mobility across organizations belonging to different forms. Another study that suggests itself is an investigation of the effects of such mobility on performance outcomes for organizations. We hope to report the results of such analyses in future work.

NOTES

1. However, their greater visibility may instead make larger generalist organizations more vulnerable to isomorphic pressures.
2. However, their larger stores of slack resources may make larger specialists less vulnerable to isomorphic pressures.

3. In chronological order, these are Pennsylvania (1968), Indiana (1971), New York (1976), Massachusetts (1977), Mississippi (1977), Rhode Island (1977), Colorado (1978), Connecticut (1978), New Mexico (1978), Alabama (1979), South Carolina (1980), Virginia (1980), Florida (1981), New Hampshire (1981), New Jersey (1981), Ohio (1981), West Virginia (1981), Arizona (1982), Georgia (1983), Missouri (1983), Maine (1984), Minnesota (1984), Tennessee (1985), and Kansas (1989).

4. Three factors other than those included in our analysis shape job structures. *Production technology* fundamentally influences the tasks that organizations must do and the way organizations structure those tasks (e.g., Baron & Bielby, 1986; Blau, McHugh Falbe, McKinley, & Tracy, 1976; Kelley, 1990; Pugh, Hickson, Hinings, & Turner, 1969). But our research site is an industry where firms rely on a production technology that dates back 12,000 years to the Neolithic era. Thus, differences in technology, both cross-sectional and longitudinal, are relatively small in our sample. And the *gender and racial composition* of organizations' workforces (e.g., Baron & Bielby, 1986; Strang & Baron, 1990) has a huge impact on the shape of job structures. Unfortunately, we do not have data on workers' gender or race. Therefore, we cannot touch on these important determinants of job structures.

5. The effect of any covariate can be evaluated in terms of a multiplier of the number of job titles and functions. This multiplier is obtained by exponentiating the product of any variable's estimated coefficient over a range of values for that variable. For continuous variables, this range typically runs between the mean and the mean plus or minus one standard deviation, while for binary variables, it runs between zero and one.

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APPENDIX

Table A1. Baseline Models of Job Structure Complexity (Control Variables Only).

Model Number	1	2	3	4
Organizational Form	Mass-Producer Wineries		Farm Wineries	
Dependent Variable	No. Job Titles	No. Functions	No. Job Titles	No. Functions
Calendar year	.013***	.012**	.008†	.007
	(.004)	(.004)	(.004)	(.004)
Cumulative number of acquisitions	.059**	.035	.244†	.308*
	(.022)	(.027)	(.139)	(.138)
Number of mass producers in the state/100	.285**	.341***	.234*	.279*
	(.091)	(.094)	(.117)	(.125)
Number of farm wineries in the state/100	−.101***	−.119***	−.034	−.040†
	(.022)	(.024)	(.024)	(.022)
Number of plants	.001	.007	.010	−.052
	(.009)	(.014)	(.088)	(.086)
Diversification: number of brands	.002	.0001	.050***	.054
	(.005)	(.006)	(.014)	(.013)
Diversification: number of product types	.031	.030	−.013	.007
	(.020)	(.022)	(.023)	(.026)
Vertical integration: vineyards (10^3 acres)	.0005	.0007†	.391	.562
	(.0003)	(.0004)	(.406)	(.469)
Vertical integration: bottling line (yes = 1)	.150**	.177***	.192***	.173
	(.049)	(.058)	(.044)	(.042)
Ln(size) (storage)	.149	.150	.139***	.104
	(.028)	(.029)	(.027)	(.025)
Ln(age)	.036	.083†	.013	.005
	(.046)	(.050)	(.040)	(.039)
Farm-winery law (yes = 1)	−.106†	−.150*	−.018	−.034
	(.059)	(.074)	(.054)	(.065)
Wald χ^2	386.7	347.9	193.2	148.3

Notes: This table presents firm fixed-effects Poisson regression analyses on mass-producer and farm wineries in the United States between 1941 and 1989, inclusive. The subscript MP refers to mass producers in the same state as the focal farm winery; the subscript FW, to other farm wineries in the same state as the focal farm winery. Robust standard errors, which are in parentheses below parameter estimates, were clustered by winery. $^{\dagger}p < .10$, $*p < .05$, $**p < .01$, and $***p < .001$, two-tailed t tests.