Successful Transition to a Market Economy: An Interpretation From Organizational Ecology Theory and Institutional Theory

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By

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Abstract

This paper investigates the rationales for the successful economic transition in a transition country through the lens of organizational ecology theory and institutional theory. Initially, the new private sector emerges and survives because of "legitimacy spillovers" from the legitimized transitional mixed sector and some market-oriented identity overlap. Over time, as the private sector builds its own legitimacy, it competes with the state and the mixed sector and challenges their existence. Finally, the Schumpeterian "creative destruction" process replaces the old out-of-date sectors with the new dominant sector. Consistent with organizational ecology theory, the evolution and dynamics of the three economic sectors take place through their interactions, which determine the emergence, prominence, decline and exit of firm populations in each sector. Depending on whether a centrally planned or market-oriented political legacy plays the dominant role in the regional environment where the transition takes place, local institutions play a moderating role in stimulating or hindering this evolution process. Empirically, we test this mechanism using census data for firms operating in Vietnam between 2000 and 2013, applying Blundell and Bond's generalized method of moments (GMM) estimation technique and the piecewise exponential hazard model to study the interaction effects of economic sectors in terms of profitability and survival.

Keywords: organizational ecology theory; institutional theory; ownership type; organizational form; economic sector; transition countries; Vietnam.

JEL: E02; L00; L26; N15; O00; P20.

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1. Introduction

Three decades have elapsed since the former socialist countries began their transition towards a market economy. Most of them have successfully completed the transition, but they have taken different paths in doing so. During the initial stages, while China and Vietnam experienced a smooth transition, output in the Baltic and Balkan states was U-shaped, and countries in the Commonwealth of Independent States experienced critical situations (Puffer et al., 2010; Sonin, 2013; Malesky and London, 2014).

Economic discussion has so far attributed such differences to the *speed* of transition, distinguishing between "shock therapy" and "gradualism." While shock therapists took East European countries and Baltic states as typical examples of fast liberalizers and successful stabilizers, gradualists cited the success of China as a result of gradual liberalization and smooth economic transformation (Huyghebaert and Quan, 2011; Tang et al., 2017). Fast liberalizers, despite successfully setting up a market-oriented economic system, often suffered an initial slump in output because of organizational failure and rapid output relocation, missed reabsorption of resources accumulated elsewhere, and short-term increases in unemployment (Blanchard, 1997; Lipton and Sachs, 1990). Gradualists liberalized the market at the margin to enable market institutions to take shape and economic agents to acquire required market knowledge and behaviours before facing fierce competition (Colombatto, 2002). Although slower, their transition to a market economy prevented initial negative GDP growth.

Vietnam followed a unique transition pathway. Although the country applied the "Polish style shock therapy" policy to quickly deregulate the pricing system and unify multiple exchange rates, it still managed to avoid transformational recession, which is a critical advantage of the gradualist transition path (Popov, 2000: 2). How could the country attain such a successful combination? Does this success signify that "shock therapy" and "gradualism" are not necessarily mutually exclusive but indeed can be mutually supportive?[1] This paper follows a holistic approach to answer this question by taking ideas from organizational ecology theory

[1] The Shock therapy versus Gradualism debate has never been successfully negotiated. They are two main points for each side: the question of simultaneity on the one hand and the question of path dependency on the other (Boettke et al., 2005).

and institutional theory to investigate the interaction and evolution of economic sectors underpinning the successful transition from the centrally planned mechanism to the market one.

Organizational ecology theory is a powerful analytical tool for analyzing the process of organizational diversity and evolution over a long period of time (Carroll, 1997), which has been found to be a function of a "structural" and an "ideological" fit with the environment. Institutional theory suggests that this fit is also contingent on institutional arrangements, which may stimulate or inhibit the evolution process (Cui et al., 2016). Institutions represent both formal and informal "rules of the game" that are created to regulate and monitor business activities (Oliver, 1997). Among them, ownership arrangements setting the boundaries between the state economic sector (state ownership) and the private economic sector (private ownership) played a crucial role in Vietnam's transition to the market mechanism.

We believe that the process through which Vietnam became a fast-growing economy is the result of a public policy aimed at promoting original, successful organizational changes in a centrally planned economy. The country was characterized by "high context," in the sense that all aspects of ideological, political, economic and social environment existed not merely as a "context" but also as an extension of state ownership. As a total institution, not only did the state economic sector reflect certain institutional realities, but it also enhanced an institutional context in which other economic sectors (private, collective, mixed and foreign) coexisted. We attempt to identify the impact of the dynamic interaction among these economic sectors on their economic performance (return on sales) and "survival" using census data for the period 2000–2013, a decade after the *doimoi* policy was introduced in 1986 to officially recognize the legal status of private ownership in the Vietnamese constitution.

This paper is organized as follows. Section 2 discusses the literature on economic transition through the lens of organizational ecology theory and institutional theory, and presents our research hypotheses. Section 3 describes the dataset, and Section 4 presents the econometric strategy. Section 5 contains the results of the empirical analysis, and Section 6 presents the robustness check. Finally, Section 7 discusses the main findings of our study.

2. Literature discussion and research hypotheses

Over the last two decades, numerous studies have sought to interpret the rationales behind the transition path of former socialist countries; however, most of those studies have not provided a clear-cut meaning for "transition." While the neoclassical tradition views transition

as "a major change in the coordination and allocative system" to maximize organizational efficiency (Allsopp and Kierzkowski, 1997: 5), the institutionalist tradition considers transition as an evolutionary process from the formal institutions under the socialist regime to those under the capitalist regime. We argue that the term "transition" entails a connection between two opposite economic systems: a centrally planned economy and a market economy (Colombatto, 2002; Boettke and Coyne, 2004). Although the two systems exploit similar production factors, they use different strategies to generate wealth for people. While the centrally planned economy uses administrative and arbitrary commands to enforce relationships among economic agents whose assets are mostly owned by state-owned enterprises (SOEs), the market economy uses the rule of law to enforce spontaneous relationships agreed upon by private economic agents. Since the centrally planned model is rejected in both theory and practice for its economic inefficiency, the term "transition" strictly implies a continuous process where components of the model are eliminated and replaced with market-compatible ones, but not vice versa. In other words, the state economic sector is gradually eliminated, integrated or transformed into a private economic sector through privatization processes.

Most transition countries experienced a U-shaped growth pattern—an initial decline followed by a gradual rise back to its previous peak—and different theories offer different explanations for this pattern. Mainstream transition theorists attribute the initially sharp slump in output to the structural change resulting from reallocation of resources from the old state-owned sector to the emerging private-owned sector (Lipton and Sachs, 1992; Boycko et al., 1993). Non-mainstream economic schools, such as new institutional economics, evolutionary economics and neo-Austrian economics, distance themselves f from the idea of path-dependence and place responsibility on the collapse of state institutions during the infancy of market institutions are still at an infant stage (Voigt and Engerer, 2002).

China and Vietnam did not undergo a U-shaped adjustment of output and employment. The preservation of an authoritarian government under the Communist Party, is responsible for their successful reforms (Popov, 2007). However, those two countries followed substantially different pathways: while China followed a "dual track" liberalization approach to maintain "the co-existence of a market track and a planned track" (Lau et al., 1997, 2000; Li, 2005; Cai and Liu, 2015), Vietnam adopted a "hold-and-see" approach that created the mixed ownership sector through which it could gradually transform bureaucratic entrepreneurship[2] and state-

[2] Following Teske and Schneider (1995) and Ohemeng (2018: 1), we conceive bureaucratic entrepreneurs (or "public sector entrepreneurs") as the "actors who help propel dynamic policy change in their community.

owned productive capabilities into market-oriented ones (Tran, 2019). Further, while China adopted an export-led growth model that focused on attracting foreign investments and relying on foreign firms' resources and technology to maintain rapid growth (Popov, 2007: 28), Vietnam's private sector-led growth approach prioritized supporting new and young private firms to replace out-of-date SOEs as the main engine of national economic growth. Therefore, organizational outcomes substantially differ between the two countries: whereas Vietnam has helped a young class of habitual entrepreneurs who are highly involved in start-up activities flourish (Carbonara et al., 2020), China has been characterized by the emergence of large and diversified business networks (*guanxi*) (Yu et al., 2015; Zhang et al., 2016).

2.1. An interpretation through the lens of organizational ecology theory

Organizational ecology theory focuses on organizational populations and provides a useful explanation of the market selection process underlying organizational diversity and market dynamics (Hannan and Freeman, 1989; Carroll and Khessina, 2019). Consistent with this approach, market dynamics appear to be driven by structural inertia and interactions among organizational populations (Singh and Lumsden, 1990; Hannan, 2005; Hsu and Hannan, 2005; Bogaert et al., 2016).

The theory is based on two main assumptions.

Under the "Darwinian logic" assumption, organizations adapt to their environment and become institutionalized with bureaucratic and structural inertia (Salimath and Jones, 2011). This institutionalization process creates inertial forces against organizational change that make organizations change more slowly than the external environment (Hannan and Freeman, 1988). Inherently, failure to adapt to environmental changes ultimately leads to organizational failure. However, adaptation can also produce risks that threaten institutional stability, such as disruptions in organizational structure, routines and credibility, which may also lead to failure. Thus, an interesting paradox emerges in the sense that inertia could arguably be an asset or a

Similarly to other entrepreneurs, they engage in the act of creative discovery by creating or exploiting new opportunities to push forward their ideas." This entrepreneurial figure, typical of the public sector, "identifies market opportunities within the political landscape [and] optimizes the performance-enhancing potential of innovation for the public sector organization" (Currie et al., 2008: 987).

liability to organizational survival, depending on factors existing in the larger population of organizations.

Under the "Schumpeterian creative destruction" assumption, the organizational form dominated by out-of-date organizations will gradually decline and be replaced with advanced, up-to-date organizational forms. Thus, organizational survival is dependent on an "ideological fit" with the environment (Shenkar and Glinow, 1994). It is worth noting that legitimation is "a social judgement for acceptance, appropriateness and desirability," consisting of standards and rules established by the government and normative legitimacy created by professional bodies in the form of norms and social values (Zimmerman and Zeitz, 2002: 415). This selection process fosters the creation, emergence and replacement of the fittest players rather than the adaptation of the old ones (Carroll, 1997).

The analytical tools developed by this theory can be aptly used to study the interaction among organizational forms with the aim to explain where, when and under which conditions the emergence and prominence of new organizational forms results in the decline and replacement of old forms (Xu et al., 2014). This evolutionary process is contingent on two conditions. First, a new organizational form emerges and dominates only if it receives or accumulates enough "constitutive legitimation," i.e., it becomes institutionalized and is accepted socially and by the government (Hannan et al., 2007; Carroll and Khessina, 2019). Second, "diffuse competition" for limited space and resources in the marketplace is necessary to enable the Schumpeterian "creative destruction" process to take place and allow for "the survival of the fittest" (Bogaert et al., 2016).

In the transition from the centrally planned economy to the market economy, the old state-owned organizational form and the new privately owned organizational form are not necessarily fully independent. Thus, the new form cannot be replaced with the old form. This replacement may require extensive interactions to transfer not only centrally planned productive capabilities to market-oriented product systems but also "social-political legitimacy" to emerging privately owned enterprises (POEs). It is our assumption that, to facilitate this interaction and reduce transaction costs, an intermediary organizational form exhibiting characteristics of both the state ownership form and the private ownership form could be created to replace the boundary separating the state sector and the private sector with "thick crossing points," where knowledge transfers are crucial, complex, numerous and interdependent (Baldwin, 2008: 187; Dobrev et al., 2006; Alvisi et al., 2011). This transitional

sector would enable state officers with sophisticated expertise to play the role as bureaucratic entrepreneurs to conserve existing, rare productive capabilities until private entrepreneurship, market institutions and market-based productive capabilities are developed. As a result, a combination of the distinctive resources and productive capabilities of the old, transitional and new organizational forms would provide greater functionality and effectiveness for a smooth and successful transition.

2.2 An application of organizational ecology theory to economic transition in Vietnam

The economic transition in Vietnam was characterized by the gradual transformation of productive capabilities from the old state-owned production system to the new market-oriented private system through the transitional mixed system, which shares some organizational identity overlap[3] with both the old and the new system. We investigate the evolution and interaction of the three main organizational forms (state, private and mixed) and the moderating effect of institutions on this interaction.[4] Organizational ecology is the theoretical framework within which we examine the evolution of three organizational populations in Vietnam, which are the main (but not the sole) categories of ownership of industrial enterprises in the country: state-owned enterprises (SOEs), privately owned enterprises (POEs), and mixed-owned enterprises (MOEs).

2.2.1. State-owned versus privately owned enterprises

Influenced by the belief in the inherent superiority of public ownership and the central planning mechanism, the socialist economy is characterized by a centrally planned institutional system supporting the dominance of state-controlled market transactions over private ones (Kornai, 1992). SOEs, acting as government agencies owned by the citizens but operated and managed by the State, enjoy considerable preferential treatment and resource advantages for

[3] Organizational ecologists define an organizational form as "a type of socially coded identity" (Poolos et al., 2002: 85), which is further defined as "an established set of social codes that specifies the properties" (Li et al., 2007: 176), or "denotes and connotes both cognitive recognition and imperative standing" (McKendrick et al., 2003: 61) that the form can legitimately possess. In this sense, these two different organizational forms have identity overlap when they are "proximate in cognitive space" or "share some identity codes" in order to benefit from similar "cognitive recognition and social acceptance" (Xu et al., 2014: 521) and exhibit mutualism in identity space (Dobrev and Kim, 2006).

[4] Among the other categories of ownership, foreign ownership is excluded from our analysis due to its distinctive characteristics that depend on many other geographical, social and economic features beyond the control of the Communist party and the Vietnamese government.

building a solid base of productive capabilities and innovation capacities for boosting economic growth during the transition (Sachs et al., 2000). Despite playing a pivotal role in a socialist economy, SOEs pursue the state's political and social goals (Shleifer, 1998), which are often at odds with enterprise efficiency and profitability. In contrast, POEs are owned by private investors and governed by economic and market-driven imperatives that rest, crucially, on the importance of incentives to innovate and reduce costs. Although market economic institutions and POEs exist in the central planned system to meet the need for informal trade transactions, they are able to provide only simple and not particularly innovative products for society due to limited access to resources and the market (Johnson et al., 2002; Long, 2010; Lu et al., 2015).

When the transition process builds formal market institutions to secure private property and market transactions and remove internal trade barriers to allow both SOEs and POEs to transact freely with any customers, private ownership is legally recognized by the government and accepted by industry associations (Hsu and Hannan, 2005; Perretti et al., 2008). However, beside the government's legal recognition, the newness of POEs is a liability and requires recognition from the existing, legitimated state-owned sector for their proliferation in a hostile institutional environment of transition economies (Singh et al., 1986). As aptly shown by Carroll and Khessina (2019: 532), "an organizational form gains legitimation when it attains a 'taken-for-granted' character, that is, when relevant audiences and gatekeepers see it as the 'natural' way to perform some kind of collective action." Given their opposing centrally planned ideologies, SOEs are unable to transfer legitimation to POEs and support the emergence and expansion of POEs in the marketplace. Their small population and limited experience in market transactions (mainly simple ones) weaken their competitive position further in relation to state-owned incumbents. Thus, the relationship between state ownership and private ownership is entirely competitive (Ingram and Simons, 2000). We therefore make the following hypothesis:

H1: The density of SOEs is negatively associated with the economic performance of POEs (H1a) and thus is positively associated with the exit rate of POEs (H1b).

As more private members "join the club" over time, consistent with the ecological theory of density-dependent legitimation and competition, one may postulate that the vital rates of POEs depend on the density of POEs, i.e., on the number of members of that organization, which help one another to survive and prosper (Hannan and Carroll, 1992; Xu et al. 2014; Carroll and Khessina, 2019). As the organization grows smaller, POEs are more likely to grow

in number, gain market share and ultimately achieve superior economic performance (profitability).

The development of both *privatized* enterprises and *new private* enterprises, most of which are small and medium-sized, enables production systems to be more dynamic and market-oriented. Under favourable market institutions, via the linkages with large enterprises, entrepreneurs of small and medium POEs have many opportunities to access capital markets and technological markets (Santarelli and Tran, 2012). As a result, they gradually become competitive rivals against corporate or bureaucratic entrepreneurs of large SOEs, who tend to seek privileges and protection from the government. We therefore make the following hypothesis:

H2: The density of POEs is negatively associated with the economic performance of SOEs (H2a) and thus is positively associated with the exit rate of SOEs (H2b).

2.2.2. State-owned versus Mixed-owned enterprises

As SOEs continue to be given political priority, bureaucratic entrepreneurs gradually become unproductive and harmful to economic growth, given their tendency to seek privileges and protection from the state (Douhan and Henrekson, 2008). As the country formally starts its transition process and removes all subsidies and protection for state ownership, SOEs gradually became unprofitable and unproductive. They suffer from excessive bureaucracy and agent-principal problems, leading to high transaction costs and inefficient use of productive resources (Voigt and Engerer 2002; Li et al., 2012). As a result, they are partially privatized to gradually incorporate market-oriented principles in their strategic operations.

However, the privatization process is not as smooth and efficient as one might expect. State ownership, with its anti-market principles, cannot directly support the legitimation of private ownership. Consistent with organizational ecology theory, legitimacy spillovers can only occur if there is some overlap of identity between the new organizational form and the old one (McKendrick and Carroll, 2001; McKendrick et al., 2003). This implies that when state ownership from socialism and private ownership from capitalism have no identity overlap, a third organizational form sharing some identity overlap with both the old and new forms will act as an intermediary transferring legitimation between them. This transitional form receives constitutive recognition and legal protection associated with the old, strongly legitimated form, and then gradually let its accumulated legitimacy spill over into the new, weakly legitimated

form. Importantly, it creates a favourable institutional environment to facilitate the proliferation of the new advanced sector (Liu et al., 2016).

While Xu et al. (2014) consider collective ownership as the transitional organizational form in the case of China, we claim that mixed-owned enterprises (MOEs) play this bridging role in Vietnam. Mixed ownership is actually "a hybrid form" of property ownership in which organizational stakes are shared between SOEs and POEs or between SOEs and foreign-owned enterprises (FOEs) (Nee, 1992). Thus, the presence and proliferation of the mixed organizational form are able to quickly reduce the density of the out-of-date state organizational form and increase the density of the emerging private one. Politically, MOEs are treated like SOEs because they are still under the control of local governments at various levels, and therefore they enjoy legitimacy in the eyes of the government and other political institutions. Sharing the same political identity with SOEs, MOEs can benefit from knowledge and technological spillovers from SOEs (Peng, 2001). In turn, as a semi-public form, MOEs support and strengthen the backbone position of SOEs. From the perspective of organizational theorists, the relationship between state ownership and mixed ownership is entirely supportive and mutually beneficial. We therefore make the following hypotheses:

H3: The density of SOEs is positively associated with the economic performance of MOEs (H3a) and thus is negatively associated with the exit rate of MOEs (H3b).

H4: The density of MOEs is positively associated with the economic performance of SOEs (H4a) and thus is negatively associated with the exit rate of SOEs (H4b).

2.2.3. Private-owned versus Mixed-owned enterprises

Economically, operating under the democratic mechanism and applying the same market-oriented principles, mixed ownership has a common characteristic with private ownership in terms of market incentives and non-state ownership. Thus, it has a supporting relationship and is able to transfer its legitimacy to the emerging private ownership (Nee, 1992). In particular, SOEs were transformed initially into MOEs through privatization policies. MOEs were maintained during the transition to serve two main objectives. First, they preserve SOEs' productive capabilities and bureaucratic entrepreneurship accumulated from the command economic system. Second, since MOEs themselves are gradually transformed into POEs by removing state capital and state control from their capital and governance structure, they could

either capitalize these preserved assets or transfer them into other emerging POEs. We therefore make the following hypothesis:

H5: The density of MOEs is positively associated with the economic performance of POEs (H5a) and thus is negatively associated with the exit rate of POEs (H5b).

However, new POEs with their clear market incentives will compete with other firms in the marketplace, including mixed ones. In other words, the emergence and growth of the private sector bring strong competition and failure risks for the state and mixed sector. In conclusion, although MOEs' presence has a supporting effect on the proliferation of POEs, the presence of POEs exerts a detrimental impact on the survival of MOEs. We therefore make the following hypothesis:

H6: The density of POEs is negatively associated with the economic performance of MOEs (H6a) and thus is positively associated with the exit rate of MOEs (H6b).

Over time, and after the necessary interactions, POEs strengthen their legal status and productive capabilities and crowd out the transitional MOE form and the old SOE form. Although this "creative destruction" process is well understood and studied at the firm and industry level, how the process works at the level of the national economic system is still beyond our knowledge. We therefore apply institutional theory to explore how social and economic conditions influence the evolution of the national economic system during the transition.

2.3 The moderating effect of institutions

Organizational ecology and institutional theory are not only complementary but also hierarchically related (Baum and Oliver, 1996). The two theories have been integrated in a single theoretical framework in prominent studies by Baum and Oliver (1992, 1996), Tucker et al. (1990), Barnett and Carroll (1993), Peng (2002), Zhou and Witteloostuijn, (2009), and Zhou (2010). These authors suggest that institutional variables impact the ecological dynamics of organizational population.

To the best of our knowledge, no one has ever investigated the moderating effect of institutions on the dynamic ecology of legal ownership forms during the transition process in emerging and transition economies. Inherently, the institutional environment constructs the legal and social context that facilitates or hinders ecological processes by fixing market selection criteria to select "the fittest" organizational forms. Thus, institutional theory may

prove useful in explaining how legitimation of new organizational forms is constructed and varies across geographical regions because it offers an institutional approach to population ecology as a broad analytical framework, thereby providing insight into the particulars of the context within which the new form emerges and develops (Thornton et al., 2012).

Below the two institutional legacies of, the market economy and the planned economy, firms in transition economies are not only constrained by them but also required to be dynamically adaptive to the institutional transformation from the old planned legacy to the new market legacy. On the one hand, organizational evolution is imprinted with social, cultural and technical patterns from the initial founding conditions. These patterns become established and institutionalized as organizations build coherent systems to support their development (Cui et al., 2016). On the other hand, organizational evolution can be interrupted and constrained by local institutional changes triggered by the shift from state socialism to market capitalism. These changes are expected to decrease the "political capital" and "institutional buffering" of state ownership (Nee and Opper, 2010) and thus create a level playing field for all economic agents regardless of their organizational form. However, this transition proceeds spatially and temporarily in different forms and at different speeds, turning the country into "a mixed bag" of institutions (North, 1990: 64). Empirical evidence in transition countries highlights substantial regional disparity in the quality of economic institutions (Chang and Wu, 2014; Peng et al., 2015; Carbonara et al., 2018). The stronger the local government's commitment to introduce competitive market institutions in a province, the higher the quality of local institutions will be in that province (Tran, 2019).

Focusing on the interaction between institutions and organizations, institutional economists argue that legitimacy and social support from external constituents in the institutional environment improve the survival likelihood and the economic performance of an organization (Dacin et al., 2007; Chang and Wu, 2014). Legitimacy is a resource that is at least as important as human, financial and social resources (Zimmerman and Zeitz, 2002). So what is the source of legitimation for organizations? It depends on which economic institution mechanism comes into play. With the argument on regional disparity in institutional quality above, two scenarios for the source of legitimation can be determined.

Unsurprisingly, in a low-quality environment where market mechanism is weak or even absent, the still dominant centrally planned institutions promote state ownership through a wide range of support mechanisms (Tran, 2019). Not only SOEs but also firms with high-level

government connections can use their strong political capital to secure resource advantages and preferential treatment (Baum and Oliver, 1996). Legitimation in this planned, system-like environment is an institution-based process, which is provided by the state (government) and not by the market. Inherently, while SOEs possess legitimacy and supreme legitimate power in the marketplace, MOEs have strong political connections with planning authorities, share the same political identity with SOEs, and can strengthen their legitimacy and density to support and reinforce the backbone position of SOEs (Peng, 2001).

As a "hybrid form" of property ownership, MOEs exhibit both centrally planned and market ideology characteristics. The two opposing ideologies rarely have a symmetric and equal effect on the evolution of MOEs. One will exert more power than the other, depending on which economic institution with its respective political ideology is the governing institution. Thus, in a dominating centrally planned institution, MOEs have more identity overlap with SOEs than with POEs. As the institutional restructuring process gradually eliminates the governing role of the centrally planned mechanism, the supportive and mutually beneficial relationship between MOEs and SOEs will be diminished over time. In other words, institutional quality is negatively associated with the supporting relationship between state ownership and mixed ownership. In the context of our analysis, we hypothesize:

H7: The interaction between local institutional quality and MOEs' density is negatively associated with the economic performance of SOEs (H7a) and positively associated with the exit rate of SOEs (H7b).

By the same reasoning, a high-quality institutional environment is characterized by a more efficient, more competitive market. Given the successful institutional restructuring, all firms, regardless of their organizational form, face a lower level of uncertainty, fewer resource constraints and lower transaction costs and are all on a level playing field (Nee and Opper, 2012). Therefore, legitimation in this market-system-like environment is a market-based process in which competitive forces and ecological logic take the leading role in determining the growth and decline in accumulative numbers of organizations, i.e., the size of an organizational population. In a dominating market institution (a high-quality institution),

MOEs have more identity overlap with POEs than with SOEs. Their supportive and mutually beneficial interaction with POEs is significantly enhanced. We hypothesize:

H8: The interaction between local institutional quality and MOE density is positively associated with the economic performance of POEs (H8a) and negatively associated with the exit rate of POEs (H8b).

3. Data description

We use census data from a survey conducted annually by the Vietnam General Statistics Office (GSO) in their Enterprise Surveys. Our dataset covers all currently operating and legally registered businesses with a certain ownership form from 2000 to 2013.[5] The number of firms ranged from 42,307 firms in 2000 to 379,125 firms in 2013.

Privatization and dissolution processes led to the exit of nearly 75% of SOEs during our survey period. In particular, an average of 25% of SOEs exited the market during the period 2000–2003 as a result of the formal promulgation of New Enterprise Law in 2000. In these three years, the government privatized most of the large SOEs and dissolved inefficient smaller ones. From 2004 onwards, the exit rate was around 14% to 18%, mainly due to natural reasons such as poor performance and bankruptcy. As expected, the exit of SOEs paralleled the significant increase of mixed firms in the marketplace; 80% were newly created from 2000 to 2002. From 2005 onwards, the number of SOEs gradually decreased from 3000 to about 1500 firms with very few startups, and was a noteworthy increase of new collective-owned enterprises (COEs)[6] (average of 13% per year) and mixed-owned enterprises (average of 22% per year). The number of new POEs rocketed up by about 25,000 per year. The gross number rose sharply by an average of 25% from 2000 to 2008 and then by roughly 12% per year from 2009 to2013.

The second dataset that we use is the GSO Provincial Annual Report for data on provincial population and density. For measures on institutional quality, the Provincial Competitiveness Index (PCI) dataset, built through a collaboration between the Vietnam Chamber of Commerce

[5] We choose the period 2000-2013, a decade after the *doimoi* policy was established in 1986 for our analysis because the quality of large-scale census data significantly improved after 2000 when the government launched the New Enterprise Law. The Law not only removes the discrimination towards POEs, but also officially and seriously includes them in the government's annual statistical coverage.

[6] COEs are "enterprises and institutions with a collective ownership of production means" (Zhang et al., 2001: 332). Also largely present in China, they comprise township enterprises, village enterprises and cooperative enterprises.

(VCCI) and the U.S. Agency for International Development (USAID), develops a weighted average provincial institutional index that measures different aspects of local formal or informal governance.[7] To clean the data, all firms with negative total assets, sales and employees are dropped. The outliers are controlled by censoring the top and bottom 1% of observations in the distributions of each variable. The final sample for our estimation includes 6,993 SOEs, 4,495 MOEs and 581,699 POEs operating during the period 2000–2013.

Figure 1 presents the densities of firms by ownership types from 2000 to 2010. During this period, SOEs reduced substantially in number, from over 5000 in 2000 to less than 2000 in 2010. While SOEs still kept exiting the market, we observe a U-shaped trend for COEs: a sharp reduction from 2000 to 2007 (exit of state-governed COEs) and a strong revival since 2008 (entry of new market-oriented collective companies). In contrast, the number of mixed firms has an inverted U-shaped growth, increasing steadily from 2000 to 2007 to support the skyrocketing creation of new POEs (from about 1000 firms in 2000 to more than 250,000 in 2010) and then dropping gradually owing to their own privatization or failure to compete successfully.

Figure 1 about here

4. Method

4.1 Variables

For our dependent variables, the firm performance equation uses a standard profitability measure: return on sales (ROS). Return on sales (ROS) indicates how net income is earned from every 1000 Vietnamese *dong* (VND) of sales. For the firm survival equation, we adopt

[7] Data of PCI index and information about the methodology and reports can be obtained from http://eng.pcivietnam.org/pci-data-c16.html.

firm exit, being coded as 1 if a focal firm at time *t* did not exist in our database at time *t+1*[8]. Firm profit is controlled in the firm survival equation.

Independent variables in both equations represent the density of state ownership, mixed ownership and private ownership at the provincial level.[9] For each density, the number of firms is counted each year for the three-digit SIC industry in which the firm is operating. According to Zhou (2010), industry-level ownership structure measured by the concentration of certain ownership at the provincial level can be viewed as an important institutional feature that mirrors the extent of transition from the planned regime to a free market and moderates the ecological processes of legitimation and competition.

Another independent variable is provincial institutional quality measured by the provincial competitiveness index (PCI), which has been built annually since2006 to assess the quality of economic governance and the extent of administrative reform efforts in 63 Vietnamese provinces. The weighted PCI is a combination of scores that evaluates 10 factors reflecting firms' perception of and experience with various aspects of local economic governance in each province: (i) entry costs, (ii) land access, (iii) transparency in information access, (iv) bureaucracy, (v) corruption, (vi) policy bias, (vii) proactivity of provincial leadership, (viii) business support services, (ix) labour training, and (x) legal institutions (see Tran, 2019 for a detailed analysis of the PCI index). Generally, the higher the PCI of a province, the higher the quality of the institution in that province becomes.

We include control variables at the firm, industry and country level: (i) FOE density, combining both wholly foreign-owned subsidiaries and joint ventures; (ii) firm size, including

[8] The census database covers firm population in Vietnam: all firms that possess an independent business account and acquire their own legal status by adopting a formal ownership are subjects of the survey. The exit of a firm implies either an entrepreneurial failure due to poor performance or exit due to institutional factors (such as acquisition or privatization) (DeTienne and Wennberg, 2016). Evidently, an exit from an acquisition is different from a failure, where the former is a sign of success and the latter failure. Although we are not able to distinguish between the two, this does not impact our analysis. First, it is not our objective to study firm exit as a performance indicator but as an outcome of the ecological process. As private ownership gains legitimacy and prospers, state ownership experiences a significant decrease in its density, either economic failure, acquisition by foreign firms or privatization. Second, if the privatization only partially dissolved SOEs, it was recorded by a change in ownership type from state ownership to other types. Their tracking codes were unchanged in order to maintain a consistent follow-up over time.

[9] Under the stipulation of Enterprise Law launched in 2000, we define SOEs as those firms (i) having from 51% to 100% of their capital originating from the government and (ii) are under direct control and governance of the government. MOEs are those firms holding state capital (from 1% to 50%) and most importantly, are not under the full control of the government. For POEs, 100% of their capital is derived from private holders. It is worth noting that private firms in Vietnam do not represent a new market-based organizational form as they do in market economies. They refer to those owned specifically by private individuals. To categorize types of ownership, we rely on 3 inputs: (i) self-statement of the firm, (ii) the percentage of state capital in the total capital of the firm, (iii) the likelihood that the firm is under direct control of the government (state control).

labour size measured by natural logarithm of total labour of the firm and economic size measured by natural logarithm of total assets; (iii) capital intensity, measured as the ratio of total assets to sales; (iv) debt ratio, measured as the ratio of total debt to total assets and reflecting the firm's financial leverage and capital structure; (v) innovation intensity, measured as the ratio of investment in innovation activities to its total sales and found to be positively associated with firm performance in Vietnam (Santarelli and Tran, 2016); (vi) industry (at two-digit SIC level) return on assets (ROA) as a proxy for the industry's profitability, reflecting the attractiveness of an industry; (vii) industry (at two-digit SIC level) market structure, defined as the mean number of employees per establishment and indicating the dominance of large firms in an industry; (viii) provincial population density (number of people per square kilometre), indicating the capacity of the regional market; and (ix) entrepreneurial culture, which is richer in agglomerated cities. We code "location," to indicate a more agglomerated province where local government policy is often more receptive to economic reforms and business demands, as 1 if the firm was located in Hanoi (the capital) and Ho Chi Minh City (the biggest commercial city).

4.2 Estimation model

We test our research hypotheses by estimating two equations for each ownership type: performance equation and survival equation. The performance equation explores how the density of one economic sector influences the performance of the other sector, whereas the survival equation explores how the density impacts its survival. The firm performance equation can be written as follows:

$$ROS_{it} = ROS_{it-1}\beta_1 + X_{it}\beta_2 + X_{it}^2\beta_3 + PCI_{it}\beta_4 + (PCI_{it} * X_{it})\beta_5 + Z_{it}\beta_6 + \upsilon_i + \epsilon_{it} \quad (1)$$

$\boldsymbol{ROS_{it-1}}$ is the one-year lagged dependent variable of firm *i* in year *t*, which is included to isolate the effect of potential performance shock. $\boldsymbol{X_{it}}$is a matrix of independent variables, the density of SOEs, MOEs and POEs operating in a three-digit SIC industry. $\boldsymbol{PCI_{it}}$ is the local institutional quality in year *t* of the province where firm *i* is located. $\boldsymbol{Z_{it}}$ is a matrix of firm-, industry- and province-level control variables. $\boldsymbol{\upsilon_i}$ is an unobserved firm-specific time-invariant effect, and $\boldsymbol{\epsilon_{it}}$ is a disturbance term. The quadratic term $\boldsymbol{X_{it}^2}$ controls the non-linear effect of organizational density of both competing and mutualistic forms of ownership. The interaction $\boldsymbol{PCI_{it} * X_{it}}$ estimates the moderating effect of institutional quality on the relationship between

organizational density and organizational performance and survival. A key assumption maintained throughout this work is that the disturbances $\boldsymbol{\epsilon_{it}}$ are independent across individuals. We also treat the firm-effect $\boldsymbol{v_i}$ as stochastic, implying that it correlates with the lagged dependent variable $\boldsymbol{ROS_{it-1}}$.

We adopt Blundell and Bond's (1998) GMM estimation technique to address the following: (i) time-invariant unobserved firm characteristics $\boldsymbol{v_i}$ may be correlated with $\boldsymbol{X_{it}}$ and $\boldsymbol{Z_{it}}$;, (ii) the presence of the lagged dependent variable $\boldsymbol{ROS_{it-1}}$ may give rise to autocorrelations since it is correlated with fixed effects.

For the survival model, the variable *exit* is an indicator for whether *time* refers to a firm exiting the market (value 1) or the end of study (value 0). Since the exit rate of a firm depends on organizational density of its organizational form and other interactive forms, it is important that no functional form for this exit rate be chosen in advance (Carrol and Hannan, 2000). Therefore, we apply piecewise exponential specifications that assume that exit rates can vary between pre-defined period segments but remain constant within each segment. No strong assumptions are made about the shape of the exit rate. The piecewise exponential model has the general form:

$$lne_i(t) = \alpha_p + ROS_{it}\theta_1 + X_{it}\theta_2 + X_{it}^2\theta_3 + PCI_{it}\theta_4 + (PCI_{it} * X_{it})\theta_5 + Z_{it}\theta_6, \quad p = 1, \dots, P. \qquad (2)$$

where $\boldsymbol{e_i(t)}$ is the exit rate and $\boldsymbol{\alpha}$ is a constant that can vary between preselected periods $\boldsymbol{p}$. After experimenting with several alternatives, the following periods appear to produce the sharpest results : (0, 3], (3, 6], (6, 10], (10, 12] and periods longer than 12 years.

5. Empirical results

Table 1 presents the descriptive statistics for each economic sector, and Table 2 presents the variables' correlation matrix. We calculate the variance inflation factors to check for multicollinearity. The estimated values are all below 10, and thus multicollinearity is not a concern for our estimation.

Table 1 about here

We observe a high mean exit rate (0.28) in Table 1. In particular, nearly 28% of our sampled firms exited the market during the observation period 2000–2013. On one hand, this reflects the dynamic nature of entrepreneurship during transition: firms easily enter the market due to

the abundance of entrepreneurial opportunities in a fast-emerging market economy, but they also easily exit the market due to the challenges from a business environment characterized by underdeveloped market institutions and productive capabilities (Santarelli and Tran, 2012). On the other hand, it signifies a rapid privatization scheme by the government to restructure and reduce state ownership stake in SOEs.

5.1. Organizational forms and firm performance

To test our hypotheses, we ran separate regressions for each economic sector, as shown in Table 2. We provide three treatments: the first one investigates the density of each economic sector and their pairwise interactions. The purpose of including pairwise density interactions is to study how the interdependent relationships of each pair of economic sectors impact the performance and survival of the remaining sector. The second treatment adds quadratic terms of SOE density, MOE density and POE density to check their non-linear effect on the economic performance of both competing and mutualistic ownership forms. The third one investigates the moderating effect of institutional quality on the intermediary role of mixed ownership in the transition process.

Table 2 about here

While the past performance of the private sector is positively and significantly associated with their current performance, the state and mixed sector do not have a smooth and stable performance over consecutive years: their profitability this year cannot guarantee an equally profitable performance next year. However, when local institutional quality is taken into account in column 3, this inconsistent performance trend is no longer evident. Supporting our hypotheses H1a and H2a, SOE density is negatively associated with the economic performance of POEs (columns 7, 8, 9), and although the economic effect of the POE density is minimal, POE density is negatively associated with the performance of SOEs (columns 1, 2, 3). Since the two economic sectors represent the two opposing economic ideologies of socialism and capitalism, there is little room for POEs to grow profitably when SOEs dominate and hold monopoly power in the economy. At the same time, the proliferation of POEs with their efficient production systems and market-oriented innovative products and services would erode SOE profitability.

With respect to the interdependencies between the state sector and the mixed sector, a large population of SOEs stimulates the economic performance of MOEs, but in contrast, the

proliferation of MOEs weakens the profitability performance of SOEs. This supports H3a but contradicts H4a. We suggest that as a transitional form of state ownership, mixed ownership receive not only knowledge and technological spillovers but also legitimation transfer from partially privatized SOEs. The proliferation of SOEs would produce more profit opportunities for MOEs. However, instead of mixed firms strengthening the backbone position of state ownership, given their more market-oriented business approach, they actually become strong and direct competitors of SOEs in the market.

Finally, we find evidence to support H5a and H6a. MOE population benefits POE performance, but POE population has a harmful impact on MOE performance. In Vietnam, mixed ownership was created and maintained during the transition to transfer the whole or some parts of SOEs' material inputs, technical services and output markets to the emerging private sector. Thus, their proliferation exerted a positive effect on POEs. Nevertheless, the beneficial legitimation transfer is only one-way—from the mixed sector to the private sector. POEs did not have a similar effect on MOEs because the POEs' inherent market ideology would have a strong competitive spirit that erodes the profitability of any weaker competitors.

Looking at the pairwise interactions of the three economic sectors, we obtain some mixed results. For SOEs, as their density grows, the proliferation of either MOEs or POEs would have a detrimental impact on performance. Because of their opposing ideological properties, with SOEs following a centrally planned model and MOEs and POEs adopting a more market-oriented approach, they are unable to coexist successfully. Estimation results of the interactions between mixed ownership and private ownership suggest a mutually supporting relationship for POEs but a competing relationship for MOEs. In particular, as MOEs and POEs grow in density, they have a favourable impact on POE performance (columns 7, 8, 9), but they create a competitive force to crowd out incumbent MOEs (columns 4, 5). In general, the emergence of mixed ownership induces favourable market forces supporting the proliferation of POEs by facilitating knowledge spillover and technology transfers among firms, which then produces abundant profit opportunities available to all (Santarelli and Tran, 2012). This process is spontaneous and beyond the control of any market agent.

We explore the non-linear effect of organizational density on both competing and mutualistic forms of ownership in columns 2, 3, 5, 6, 8 and 9. We found a consistent and significant non-linear effect of SOE density on the economic performance of MOEs and POEs but in opposite directions. We also observed a significant non-linear effect of POE density on

the profitability of SOEs and MOEs (columns 3, 6) as well as of MOE density on that of POEs (column 9). Despite economic insignificance, the non-linear ecological process is consistent with Dobrev et al.'s (2006) prediction that as the population evolves, processes of legitimation become less sensitive to variations in density. There is a density threshold such that the proliferation beyond this threshold will produce a declining competing or mutualistic effect over time.

Columns 3, 6 and 9 take into account the moderating effect of local institutional quality on the bridging role of mixed ownership. High institutional quality features a competitive and efficient market, a level playing field for all economic agents, full-fledged market intermediaries and market-oriented legal systems. While POEs and MOEs benefit significantly from this positive institutional restructuring to reduce transaction costs, resource constraints and uncertainty, SOEs perform less profitably since they no longer benefit from "institutional buffering" and preferential treatments in a competitive market (Tran, 2019). Regarding the interaction terms between institutional quality and the density of mixed ownership, the coefficients are negative and weakly significant in the SOE equation (column 6), but it is positive and very significant in the POE equation (column 9). These results only partially support hypothesis H7a but statistically support hypothesis H8a. On one hand, as institutional quality improves, MOE density has a higher detrimental effect on SOE and MOE profitability. On the other hand, a higher institutional quality also stimulates the supporting effect of MOE density on POE performance. The institutional restructuring towards the forms of a regular market economy leverages the influence of market ideology over that of coexisting centrally planned ideology in mixed ownership, and thus, MOEs share more identity overlap with POEs and could expedite the transfer of legitimation and knowledge from centrally planned state ownership to market-oriented private ownership.

Regarding the effect of control variables in the performance equation, we make some interesting findings. First, foreign invested firms with their advanced innovation capacities and technologies are strong competitors for all local firms regardless of their organizational forms. However, private firms with their proactiveness and entrepreneurial alertness could benefit from valuable knowledge spillovers, acquire or learn advanced technologies from foreign competitors and rapidly capture any profitable outsourcing opportunities from their foreign partners. These benefits act generate strong momentum for profitability. Second, for state and mixed ownership, smaller firms in both labour size and asset size are generally more profitable. However, we make a different observation for POEs: POEs with a larger labour force and/or

asset pool are found to be more profitable. Third, negative and significant impact of debt ratios on the profitable performance of SOEs indicates the harmful effect of a higher ratio of debt in their capital structure. However, indebted MOEs and POEs are significantly more profitable since a large proportion of their loans would be used to finance newly recognized entrepreneurial opportunities rather than to cover operational expenses (Tran and Santarelli, 2014). Fourth, POEs with higher capital intensity are found to be more profitable. Adversely, capital-intensive SOEs and MOEs tend to misuse their endowed assets and slack resources for inefficient motives, and thus are less profitable. Fifth, innovation intensity appears to benefit only the economic performance of POEs, which is evidently more responsive to market needs and customers' preferences. Sixth, as expected, all firms, regardless of their ownership form, outperform profitably in growing industries (as characterized by higher industry ROA). Finally, all firms, regardless of their ownership form, are found to be more profitable in less populated provinces.

5.2. Organizational forms and firm exit

Now we turn to interpret estimation results of the exit equation in Table 3. It is reasonable to expect mature and large SOEs to be in tough competition with one another for the government's support and resources, but as an institutional engine of the socialist market economy in Vietnam, they can exploit their institutional monopoly positions to strengthen mutual legitimacy. These two opposing effects may offset each other, and thus result in the insignificant effect of their density on their own survival. In the same fashion, POEs, as an emerging market-oriented economic sector, may crowd out one another due to the Schumpeterian "creative destruction" process in a fast-growing market (Schumpeter, 1934). At the same time, they mutually support one another to accumulate legitimacy for proliferation during the transition. The mutualistic effect is initially found to be stronger than the crowding effect in the base model (column 7) but is weakened when the non-linearity of POE density and institutional quality are controlled in explaining POEs' exit likelihood (columns 8, 9). By sharing ownership, decision-making rights and residual incomes, MOES would benefit by legitimating each other to maintain their mutual supportive growth in the emerging market. Their density exerts a significantly negative and nonlinear impact on their exit (columns 5, 6).

Regarding the competing and mutualistic relationships, state ownership and private ownership are found to have a mutual opposing relationship in the sense that the density of

one type of ownership is positively associated with the exit rate of the other type. In other words, the existence of SOEs does not facilitate the proliferation of POEs since SOEs will use their privileged oligopoly positions to capture many valuable business opportunities and resources in the market, resulting in unfavourable conditions for new and small POEs' survival. In addition, the emergence of Schumpeterian private entrepreneurs bringing innovative and efficient products and services to market creatively destroys the old and inefficient SOEs although their crowding-out force is only marginally significant. These results strongly support hypothesis H1b but only weakly support H2b. We observe a marginally significant supporting effect of SOE density on MOEs' exit (statistically significant at a 5% level), which weakly supports hypothesis H3b. Further, we reject hypothesis H4b due to the significantly positive coefficient of MOE density in columns 2 and 3. Although MOEs share resources, technologies and a common nature of public ownership with SOEs, they are still direct and strong competitors of SOEs during the transition because of their market-oriented ideology. Finally, as our estimation results statistically support H5b, which predicts a negative relationship between density of mixed ownership and exit of private ownership (columns 7, 8, 9), we can confidently affirm the bridging role of mixed ownership in facilitating a smooth transition in Vietnam. It receives support and legitimation from state ownership (as H3a and H3b are supported) and transfer successfully to private ownership (as H5a and H5b are supported). However, we fail to support H6b, which suggests a positive relationship between density of the private sector and exit of the mixed sector. In theory, as POEs mature and accumulate their own legitimacy, the benefits of legitimacy spillover from the established MOEs become weaker and eventually disappear as their density rises. POEs and MOEs then compete for limited market share, and the Schumpeterian market selection process will separate the out-of-date from "the fittest." Nevertheless, it is worth noting that Vietnam is still in the midst of its transition process. Mixed ownership continues to play an essential bridging role to strengthen the proliferation of private ownership, and as a result, despite eroding the profitability of MOEs (as H6a is supported), POEs fail to produce a significant crowding out effect on MOEs.

Taking into account the non-linear effect of organizational density on the exit of both competing and mutualistic forms of ownership, we found a significant non-linearity between SOE density, MOE density and POE exit. This implies that over time, as POEs build their own legitimacy, the crowding-out effect from increasing SOE density and the supporting benefits from the transitional MOEs begin to reduce their influence. The quadratic terms of SOE density and MOE density are significant and follow opposite directions with the linear terms (columns

8, 9), suggesting a declining competitive relationship between SOEs and POEs and an eroding mutualistic association between MOEs and POEs once SOEs and MOEs reach a certain density threshold.

Table 3 about here

We conduct further analyses by adding pairwise interactions of the three economic sectors to the regressions. The pairwise interactions between MOE density and POE density produce a significant and positive effect on MOE exit (columns 4–6) and POE exit (columns 7–9). As POEs grow in density, they crowd out the transitional mixed firms, and the legitimation benefits that they obtained from MOEs also fade away. At the time of our study, the supporting benefits from the transitional mixed sector were no longer important to the proliferation of the private sector. In fact, the more valuable source of legitimation for POEs at this time comes from the increasing number of foreign firms (columns 8, 9). Foreign firms are actually considered to belong to private ownership form. Foreign investors have expertise and experience in market tools in a well-developed market with stable and advanced institutions. To conduct business in a transitional environment, they normally establish joint ventures with local private firms initially and then gradually shift to wholly foreign-owned enterprises (Lavigne, 1999). The competing relationship between the state sector and the private sector is re-emphasized with their significant and positive pairwise interaction: the prominence of SOEs erodes the proliferation of POEs, subsequently leading to their exit from the market.

Taking into account the moderating effect of local institutional quality on the bridging role of the mixed ownership form, we include the institutional quality index (PCI) and its interaction term with MOE density. First, this interaction is found to be positively associated with the exit propensity of SOEs in column 3, which strongly supports hypothesis H7b. As institutional quality improves, MOEs exhibit stronger market identity to adapt well to a more efficient and competitive market. Unsurprisingly, their increasing prominence in the marketplace would work against the survival of out-of-date SOEs, especially when they were both competing for public resources and government support. Further, we also support hypothesis H8b as the interaction between PCI and MOE density is statistically and negatively associated with the exit rate of POEs. Following the same reasoning, in a high-quality institutional and competitive

market, MOEs share more common market features with POEs, which stimulates their legitimacy transfer and amplifies their knowledge spillover.

Regarding the effect of control variables, our analysis produced some noteworthy results. First, the proliferation of foreign firms, while significantly prolonging the survival of POEs, has no significant impact on the survival of SOEs and MOEs. Second, regardless of ownership form, smaller firms in terms of labour size are more likely to exit the market although they may be more profitable once they surpass the survival threshold (as shown by the performance equations). Third, positive and significant parameters of both firm economic size and debt ratio indicate the damaging effect of debt and asset leveraging on exit likelihood of all firms, which is consistent with earlier studies for the case of Vietnam (Carbonara et al., 2020; Tran, 2019). Fourth, industry ROA and industry MES increase the exit rate for POEs due to the intense competition and dominance of SOEs in these established and mature industries. Finally, POEs are consistently found to have a lower likelihood of exit in less populated and agglomerated cities where the power of the government and state ownership is the least influential.

6. Robustness check

Although our large sample (approaching the population itself) enable researchers to detect smaller, subtler and more complex effects, p-values quickly drop to zero to reach statistical significance while economic significance is minimal. In particular, our estimated coefficients of POEs and their associated p-values are very small (nearly zero) in both performance and survival equations. In order to avoid relying on small p-values alone to claim support for hypotheses of little or no practical significance, following Lin et al. (2013), we draw multiple smaller samples from our large sample to check if they give consistent and "familiar" significance levels. We construct a coefficient/p-value/sample size (CPS) chart to display curves of the coefficients and their associated p-values for different samples sizes.[10] After the CPS chart, we develop the Monte-Carlo CPS chart to give additional information about the variability in estimation results.

Appendix A presents the CPS and Monte-Carlo CPS charts for POE density in SOE performance and survival equations, as well as in the POE performance equation.[11] To generate

[10] The CPS chart is based on repeatedly drawing samples of increasing sizes, running and rerunning the pre-determined statistical model on each sample, computing the coefficient and p-values of interest, and plotting them on a chart.

[11] CPS and Monte Carlo CPS charts for other equations can be provided upon request.

these charts, we run 5,000 iterations of our estimated models (models 1 and 2). First, all CPS charts show that once the sample size increases beyond a certain point, both coefficients (*b_poedensity*) and p-values (*p_poedensity*) drop to near zero values and remain there. In particular, the p-value for POE density falls below 1% once the sample size of SOEs is greater than 1000, or when the sample of POEs is larger than 20,000 observations. Second, the coefficients of POE density in the SOE survival equation are consistently positive (as hypothesized in H2b) and different from 0 until *n* reaches a sample of 200; beyond that point, additional data drive down coefficients and p-values and increase power. Third, POE density coefficients and p-values in the SOE performance equation are inconsistent when *n* is less than 300 but persist at negative values approaching 0 after that (as hypothesized in H2a). As a result, we can confidently support our hypothesis if our sample of SOEs is larger than 300 observations. Finally, we find consistently positive coefficients of POE density in the POE performance equation (supporting our estimation above), but they are very small, approaching zero after 500 observations. The coefficients are weakly significant when observations are less than 20,000 beyond which p-values are consistently less than 0.01.

The Monte Carlo simulation generates 500 samples for each sample size. Appendix A shows the estimated distribution of coefficients and p-values as a function of sample size. The median coefficient value is stable across the different sample sizes, and its variability decreases in a meaningful way. For samples below n=1000, the distribution covers the value zero, yielding statistical insignificance at traditional significance levels. The plots show decreasing noise in the coefficient estimation, reflecting the power of an increasing sample size. We see that not only do levels of p-values rapidly decrease with sample size but the variability in the p-value distribution rapidly decreases as well. In other words, we expect to see consistently very small p-values in a large sample.

6. Discussion

Our study applies organizational ecology theory and institutional theory to explain the rationales underlying the smooth and successful economic transformation of Vietnam. An important implication of our findings is that a radical, sudden reform in the national economic system is often challenging and unwelcome. Facing a hostile transition environment, the new economic sector fails to survive and prosper without legal formalization and social support from the government. We claim that in order to achieve a smooth and successful transition, the

old economic sector should undergo partial transformation through a transitional sector in the initial stage before being fully privatized. This offers a solution to the legitimation problem and conservation of state-owned productive capabilities during the transition. In particular, private enterprises and market institutions are not yet ready during the early transition period to replace the centrally planned mechanism in the coordination of production factors, whereas state-owned incumbents possess some valuable productive capabilities and entrepreneurial resources that could be inherited and integrated into the emerging market structure. Accordingly, transition economies may avoid or soften the common U-shaped performance if bureaucratic and collective entrepreneurial and productive capabilities accumulated from SOEs can be successfully protected and transformed into private entrepreneurship and market-oriented productive capabilities.

However, such a direct transition from the old SOE form to the new POE form at the national level is not smooth or possible without a bridging form between the two. Any rapid attempt to transform SOEs into POEs would fail and cause an initial decrease in output that could be damaging and long-lasting. Vietnam overcomes this problem by restructuring and strengthening the transitional form—(mixed ownership) to facilitate the transition from the old to the new. The transitional form shares some socialist properties with the old form, SOE, in terms of public ownership and the government's intensive support and control, but it also has some market identities overlapping with the new POE form such as a market-oriented business approach, asset-contributing members (taking the role of investors) sharing ownership, decision-making rights and residual incomes from the business. Thus, our hypotheses on the interdependence of the three economic sectors entail the following critical features of the evolutionary dynamics from ecology theory: the old economic sector prevents the survival and good economic performance of the new sector, and any knowledge and technology transfer from the old to the new is effected by a transitional form that shares properties with both the old and the new. However, as it becomes stronger, the efficient, new economic sector competes and removes the inefficient and old transitional sector.

We also claim that, since the economic reform involves the transition from a planned economy to a market economy, it is important to take into account the moderating effect of the institutional environment in which the transition takes place. As a "hybrid form" of property ownership, mixed ownership exhibits both centrally planned and market ideology in its identity. In a dominating centrally planned institution, the centrally planned ideology is a superior power, and thus mixed ownership has more identity overlap with state ownership.

However, in a dominating market institution, mixed ownership exhibits stronger market principles and shares more identity overlap with private ownership.

Regarding the empirical contribution, we used the census panel data extracted from the annual enterprise surveys from 2000 to 2013. We find evidence to support the emergence of a transitional economic sector, mixed ownership, to secure accumulated resources and bureaucratic entrepreneurship, and then transfer them to private ownership when the market rules have not been established. After dissolution, many ex-owners of MOEs become private entrepreneurs themselves. Therefore, we do not statistically observe the coexistence of MOEs and SOEs. Despite being under the strict control of the government and receiving significant legitimation from SOEs, MOEs adopt a more market-oriented approach. When the transition introduces capitalist features and gradually eliminate socialist factors, MOEs also face market selection challenges to survive and prosper. Furthermore, it is worth noting that our data are from the transition period, when private ownership was strongly encouraged and warranted through legislation, resulting in an amplification of both mutualistic relationship and competition between MOEs and POEs.

With respect to the effects of control variables, several interesting findings are obtained. First, foreign invested firms with their advanced innovation capacities and technologies are strong competitors of all local firms regardless of their organizational forms. However, private firms with their proactiveness and entrepreneurial alertness can benefit more from their foreign counterparts. Second, smaller firms are more likely to exit the market, although they can be more profitable if they can survive. Third, consistent with Santarelli and Tran (2016), the positive and significant impact of debt ratio on the exit rate of all three organizational forms indicates the harmful effect of a higher ratio of debt in the firm's capital structure. Fourth, innovation intensity appears to benefit the economic performance and survival of POEs, which are evidently more responsive to market needs and customer preferences. Finally, industry ROA and industry MES increase the exit rate for POEs due to the dominance of and competition with SOEs and MOEs in these established and mature industries.

Regarding policy implications at the micro level, we provide a lesson from the past for firms' and organizations' current strategic decision making. Path dependence suggests that organizational knowledge management efforts should be based on the exploitation and gradual transformation of the accumulated pool of entrepreneurial and productive resources into advanced organizational capabilities that help organizations identify, evaluate and capture

emerging business opportunities. Further, organizational reforms are also subject to institutional constraints. Any attempts to implement radical organizational changes and reforms rapidly without considering the past constraining forces and institutional environment will produce organizational inertia and unexpected outcomes.

References

Allsopp C. and Kierzkowski H. (1997). The assessment: Economics of transition in Eastern and Central Europe. *Oxford Review of Economic Policy*, 13(2): 1-22.

Alvisi M., Carbonara E., and Parisi F. (2011). Separating complements: The effects of competition and quality leadership. *Journal of Economics*, 103(2): 107-131.

Baldwin C. Y. (2008). Where do transactions come from? Modularity, transactions, and the boundaries of firms. *Industrial and Corporate Change*, 17(1), 155–195.

Barnett W. P., and Carroll G. R. (1993) How institutional constraints affected the organizations of early U.S. telephony. *Journal of Law, Economics and Organization*, 9: 98-126.

Baum J. A. C., and Oliver C. (1992) Institutional embeddedness and dynamics of organizational populations. *American Sociological Review*, 57(4): 540-559.

Baum J. A. C., and Oliver C. (1996) Toward an institutional ecology of organizational founding. *Academy of Management Journal*, 39(5): 1378-1427.

Blanchard O. (1997) The medium run. *Brookings Papers on Economic Activity*, 2: 89-158.

Blundell R. W. and Bond S. R. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1): 115-143.

Boettke P. J. and Coyne C. J. (2004). The forgotten contribution: Murray Rothbard on socialism in theory and practice. *The Quarterly Journal of Austrian Economics*, 7(2): 71-89.

Boettke, P. J., Coyne C. J., Leeson P. T., and Sautet F. (2005) The New Comparative Political Economy. *The Review of Austrian Economics*, 18(3-4): 281–304.

Bogaert S., Boone C., Negro G., and van Witteloostuijn A. (2016). Organizational form emergence: A meta-analysis of the ecological theory of legitimation. *Journal of Management*, 42(5): 1344-1373.

Boycko M., Shleifer A. and Vishny R. (1993). Privatizing Russia, *Brookings Papers on Economic Activity*, 1: 139–192.

Cai L. and Liu A.M.Y. (2015). Wage determination and distribution in urban China and Vietnam: A Comparative Analysis. *Journal of Comparative Economics*, 43(1): 186-203.

Carbonara E., Santarelli E., Obschonka M., Tran H. T., Potter J., and Gosling S. D. (2018). Agency culture, constitutional provisions and entrepreneurship: A cross-country analysis. *Industrial and Corporate Change*, 27(3): 507-524.

Carbonara E., Tran H. T. and Santarelli E. (2020). Determinants of novice, portfolio, and serial entrepreneurship: An occupational choice approach. *Small Business Economics*, 55(1): 123-151.

Carroll G. R. (1997). Long-term evolutionary change in organizational populations: Theory, models and empirical findings in industrial demography. *Industrial and Corporate Change*, 6(1): 119-143.

Carroll G. R. and Hannan M. T. (2000). *The demography of corporations and industries*. Princeton, NJ: Princeton University Press.

Carroll G.R. Khessina O.M. (2019). Organizational, product and corporate demography. In: Poston Jr. D. (eds) *Handbook of Population*. Chapter 20. Springer: Cham.

Chang S. J., and Wu B. (2014). Institutional barriers and industry dynamics. *Strategic Management Journal*, 35(8), 1103–1123.

Colombatto E. (2002). Is there an Austrian approach to transition? *The Review of Austrian Economics*, 15(1): 61-74.
Cui Y., Jiao J., and Jiao H. (2016) Technological innovation in Brazil, Russia, India, China, and South Africa (BRICS): An organizational ecology perspective. *Technological Forecasting and Social Change*, 107(1): 28-36.
Currie G., Humphreys M., Ucbasaran D., McManus S. (2008). Entrepreneurial leadership in the English public sector: paradox or possibility? *Public Administration*, 86(4): 987-1008.
Dacin M. T., Oliver C., and Roy J. P. (2007). The legitimacy of strategic alliances: An institutional perspective. *Strategic Management Journal*, 28(2): 169–187.
DeTienne D., and Wennberg K. (2016). Studying exit from entrepreneurship: New directions and insights. *International Small Business Journal*, 34(2): 151-156.
Dobrev S. D., Ozdemir S. Z., and Teo A. C. (2006). The ecological interdependence of emergent and established organizational populations: Legitimacy transfer, violation by comparison, and unstable identities. *Organization Science*, 17(5): 577–597.
Dobrev S. D., and Kim T. (2006). Positioning among organizations in a population: Moves between market segments and the evolution of industry structure. *Administrative Science Quarterly*, 51(2): 230-261.
Douhan R. and Henrekson M. (2008). *Productive and destructive entrepreneurship in a political economy framework*. Working Paper Series 761, Research Institute of Industrial Economics: Stockholm.
Hannan M. T. (2005). Ecologies of organizations: Diversity and identity. *Journal of Economic Perspectives*, 19(1): 51–70.
Hannan M. T. and Freeman J. (1988). *Ecological models of organization*. Ballinger: Cambridge, Mass.
Hannan M. T. and Freeman J. (1989). *Organizational ecology*. Cambridge, MA: Harvard University Press.
Hannan M. T., Poolos L. and Carroll G. R. (2007). *Logics of organization theory: Audiences, codes, and ecologies*. Princeton University Press: Princeton.
Hsu G. and Hannan M. T. (2005). Identities, genres, and organizational forms. *Organization Science*, 16(5): 474–490.
Huyghebaert N. and Quan Q. (2011). Ownership dynamics after partial privatization: Evidence from China. *Journal of Law and Economics*, 54(2): 389-429.
Ingram P. and Simons T. (2000). State formation, ideological competition, and the ecology of Israeli workers cooperatives, 1920–1992. *Administrative Science Quarterly*, 45(1): 25–53.
Johnson S., McMillan J. and Woodruff C. (2002). Courts and relational contracts. *Journal of Law, Economics, and Organization*, 18(1): 221-277.
Kornai J. (1992). *The socialist system: The political economy of communism*. Princeton University Press: Princeton.
Lander M. W. and Heugens P. M. A. R. (2017) Better together: Using meta-analysis to explore complementarities between ecological and institutional theories of organization. *Organization Studies*, 38(11): 1573-1601.
Lau L., Qian Y. and Roland G. (1997). Pareto-Improving Economic Reforms through Dual-Track Liberalization. *Economics Letters*, 55(2): 285-292.
Lau L., Qian Y. and Roland G. (2000). Reform Without Losers: An Interpretation of China's dual-track approach to reforms. *Journal of Political Economy*, 108(1): 120-143.
Lavigne M. (1999). *The economics of transition: From socialist economy to market economy*. Palgrave: New York.
Li P.P. (2005). The puzzle of China's township-village enterprises: The paradox of local corporatism in a dual-track economic transition. *Management and Organization Review*, 1(2): 197-224.
Li J., Yang J., and Yue D. (2007). Identity, community, and audience: How wholly owned foreign subsidiaries gain legitimacy in China. *Academy of Management Journal*, 50(1): 175-190.
Li S., Xia J., Long C.X., and Tan J. (2012) Control modes and outcomes of transformed state-owned enterprises in China: an empirical test. *Management and Organization Review*, 8(2): 283-309.
Lin M., Lucas H. C., and Shmueli G. (2013) Too Big to Fail: Large Samples and the p-Value Problem. *Information System Research*, 24(4): 906-917.

Lipton D. and Sachs J. (1992). Prospects for Russia's economic reforms. *Brookings Papers on Economic Activity*, 2: 213–283.
Liu Y., Zhang C., and Jing R. (2016) Coping with multiple institutional logics: temporal process of institutional work during the emergence of the one foundation in China. *Management and Organization Review*, 12(2): 387-416.
Long C. X. (2010). Does the rights hypothesis apply to China?. *Journal of Law and Economics*, 53(4): 629-650.
Lu H., Pan H. and Zhang C. (2015). Political connectedness and court outcomes: Evidence from Chinese Corporate Lawsuits. *Journal of Law and Economics*, 58(4): 829-861.
Malesky E. and London J. (2014). The political economy of development in China and Vietnam. *Annual Review of Political Science*, 17: 395-419.
McKendrick D. G. and Carroll G. R. (2001). On the genesis of organizational forms: Evidence from the market for disk drive arrays. *Organization Science*, 12(6): 661–682.
McKendrick D. G., Jaffee J., Carroll G. R. and Khessina O. M. (2003). In the bud? Disk array producers as a (possibly) emergent organizational form. *Administrative Science Quarterly*, 48(1): 60–93.
Nee V. (1992). Organizational dynamics of market transition: Hybrid forms, property rights and mixed economy in China. *Administrative Science Quarterly*, 37(1): 1–27.
Nee V. and Opper S. (2010) Political capital in a market economy. *Social Forces*, 88(5): 2105-2132.
Nee V., and Opper S. (2012). *Capitalism from below. Markets and institutional change in China*. Cambridge, MA: Harvard University Press.
North D. C. (1990) *Institutional change and economic performance*. New York: Cambridge University Press.
Ohemeng F. L. K. (2018). The entrepreneurial bureaucrat. In Farazmand A. (eds.), *Global Encyclopedia of Public Administration, Public Policy, and Governance.* Springer International Publishing, pp. 1-5.
Oliver C. 1997. Sustainable competitive advantage: Combining institutional and resource-based views, *Strategic Management Journal*, 18(9): 697-713.
Peng M. W., Sun S. L., and Markóczy L. (2015). Human capital and CEO compensation during institutional transitions. *Journal of Management Studies*, 51(1): 117–147.
Peng Y. S. (2001). Chinese villages and townships as industrial corporations: Ownership, governance, and market discipline. *American Journal of Sociology*, 106(5): 1338–1370.
Peng, M. W. (2002). Towards an institution-based view of business strategy. *Asia Pacific Journal of Management*, 19(2/3): 251-267.
Perretti F., Negro G. and Lomi A. (2008). E pluribus unum: Framing, matching and form emergence in U.S. television broadcasting, 1940–1960. *Organization Science*, 19(4): 533–547.
Poolos L., Hannan M. T., and Carroll G. R. (2002). Foundations of a theory of social forms. *Industrial and Corporate Change*, 11(1): 85-115.
Popov V. (2000) Shock therapy versus gradualism: the end of the debate (Explaining the magnitude of transformational recession). *Comparative Economic Studies*, 42(1): 1-57.
Popov V. (2007) Shock therapy versus gradualism reconsidered: Lessons from transition economies after 15 years of reforms. *Comparative Economic Studies*, 49(1): 1-31.
Puffer S.M., McCarthy D.J. and Boisot M. (2010). Entrepreneurship in Russia and China: The impact of formal institutional voids. *Entrepreneurship Theory and Practice*, 34(3): 441-467.
Sachs J. D., Woo W. T. and Yang X. (2000). *Economic reforms and constitutional transition*. CID Working paper No. 43. Center for International Development at Harvard University.
Salimath M. S. and Jones R. (2011) Population ecology theory: implications for sustainability. *Management Decision*, 49(6): 874-910.
Santarelli E. and Tran H.T. (2012). Growth of incumbent firms and entrepreneurship in Vietnam. *Growth and Change*, 43(4): 638-666.
Santarelli E. and Tran H.T. (2016). Diversification strategies and firm performance: A sample selection approach. *Economics of Transition*, 24(1): 31-68.
Schumpeter J.A. (1934). *Theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*. Harvard University Press: Cambridge, MA.
Shenkar O. and von Glinow M. A. (1994) Paradoxes of organizational theory and research: using the case of China to illustrate national contingency. *Management Science*, 40(1): 56-71.

Singh J. V. and Lumsden C. J. (1990). Theory and research in organizational ecology. *Annual Review of Sociology*, 16: 161-195.
Singh J. V., Tucker D. J. and House R. J. (1986). Organizational legitimacy and the liability of newness. *Administrative Science Quarterly*, 31(2): 171–193.
Sonin K. (2013). The end of economic transition. *Economics of Transition*, 21(1): 1-10.
Tang J., Tang Z. and Birton J. (2017). Exploring the relationship between entrepreneurial orientation, CEO dual values, and SME performance in State-owned vs. nonstate-owned enterprises in China. *Entrepreneurship Theory and Practice*, 41(6): 883-908.
Teske P. and Schneider M. (1995). The bureaucratic entrepreneur: the case of city managers. *Public Administration Review*, 54(4): 331-340.
Thornton P. H., Ocasio W., and Lounsbury M. (2012). *The institutional logics perspective: A new approach to culture, structure and process*. Cambridge: Oxford University Press.
Tran H.T. (2019) Institutional quality and market selection in the transition to market economy. *Journal of Business Venturing*, 34(5): 105890.
Tran H. T. and Santarelli E. (2014) Capital constraints and the performance of entrepreneurial firms in Vietnam. *Industrial and Corporate Change*, 23(3): 827-864.
Tucker D. J., Singh J. V., and Meinhard A. G. (1990) Organizational form, population dynamics, and institutional change: The founding patterns of voluntary organizations. *Academy of Management Journal*, 33(1): 151-178.
Voigt S. and Engerer H. (2002). Institutions and transformation – Possible policy implications of the New Institutional Economics. In Zimmermann K.F. (eds.), *Frontiers in Economics*. Berlin: Springer-Verlag, pp. 149-215.
Xu D., Lu J. W. and Gu Q. (2014). Organizational forms and multi-population dynamics: Economic transition in China. *Administrative Science Quarterly*, 59(3): 517-547.
Yu X., Dosi G., Lei J. and A. Nuvolari (2015). Institutional change and productivity growth in China's manufacturing: The microeconomics of knowledge accumulation and "creative restructuring". *Industrial and Corporate Change*, 24(3): 565-602.
Zhang A., Zhang Y. and Zhao R. (2001). Impact of ownership and competition on the productivity of Chinese enterprises. *Journal of Comparative Economics*, 29(2): 327-346.
Zhang L., Sjögren H. and M. Kishida (2016). The emergence and organizational persistence of business groups in China, Japan, and Sweden. *Industrial and Corporate Change*, 25(6): 885-902.
Zhou C. (2010) Toward an institutional ecology of establishment of foreign firms in the Chinese construction industry. *Journal of Chinese Economic and Business Studies*, 8(2): 167-184.
Zhou C. and Witteloostuijn A. (2009) Institutional constraints and ecological processes: evolution of foreign-invested enterprises in the Chinese construction industry, 1993-2006. *Journal of International Business Studies*, 41(3): 539-556.
Zimmerman M. A. and Zeitz G. J. (2002). Beyond survival: Achieving new venture growth by building legitimacy. *Academy of Management Review*, 27(3): 414–431.

Figure 1: Distribution of firms by ownership types from 2000 to 2010

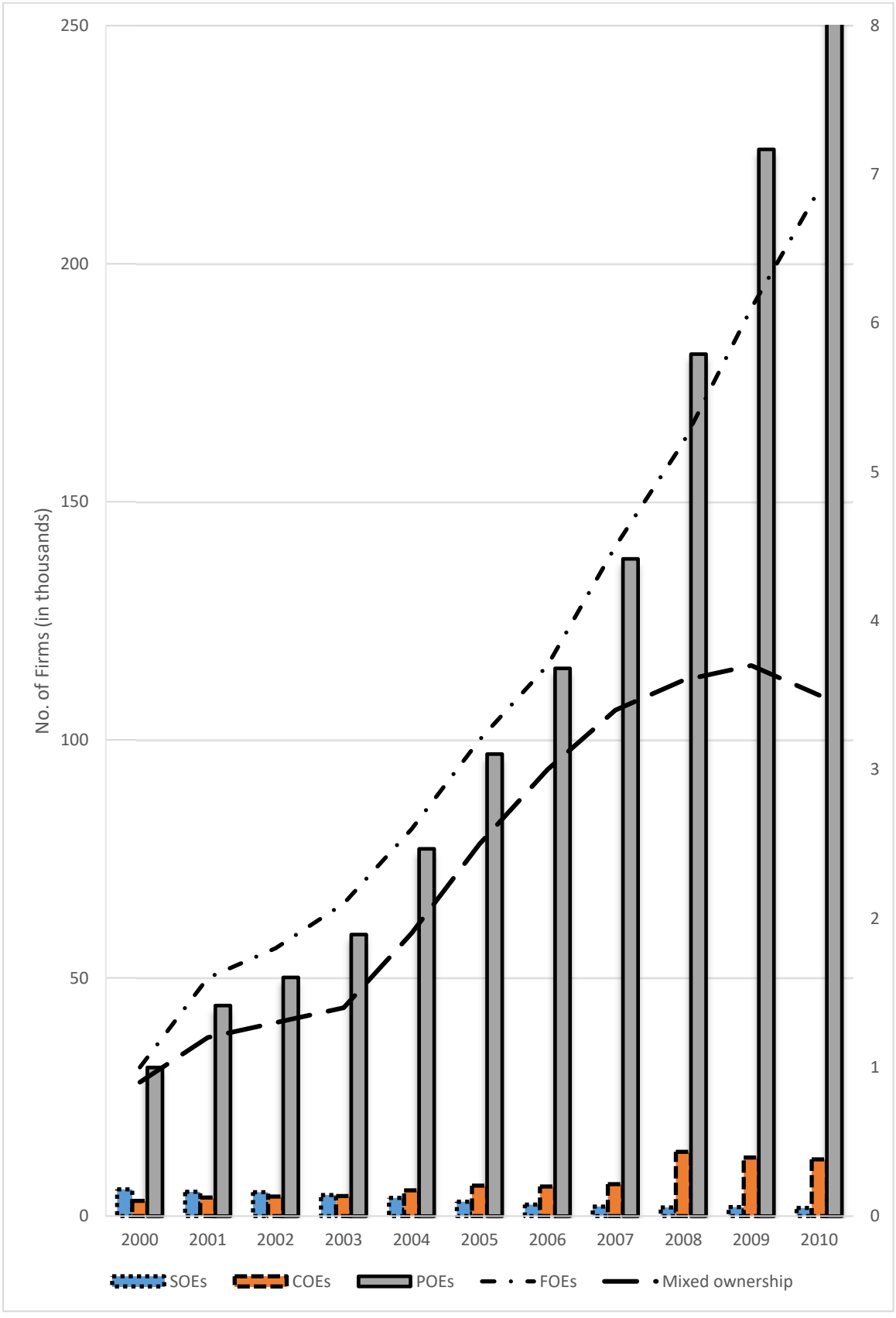


Table 1: Descriptive Statistics and Correlations of Variables

Var	Mean	Std	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	0.04	0.292	1.00															
2	0.28	0.487	.118*	1.00														
3	2.04	1.144	.114*	-.079*	1.00													
4	8.07	1.637	-.005*	-.295*	.538*	1.00												
5	0.37	0.29	.001	.014*	.003	.022*	1.00											
6	68.74	4455	-.019*	.009*	-.002	.035*	.245*	1.00										
7	1.954	177.3	-.004*	.011*	-.002	.011*	.189*	.055*	1.00									
8	3.93	8.96	.004*	.114*	.019*	.099*	.011*	.009*	.007*	1.00								
9	7.76	36.02	.038*	-.028*	.019*	-.062*	-.000	.001	-.001	.024*	1.00							
10	1748	2970	-.071*	-.130*	-.131*	.211*	.002	.001	.001	.386*	-.012*	1.00						
11	22.84	44.20	-.099*	-.167*	-.047*	.161*	.000	.007*	-.000	.201*	-.043*	.578*	1.00					
12	10.04	20.22	-.038*	.032*	-.008*	.209*	.018*	.015*	.014*	.680*	.013*	.569*	.349*	1.00				
13	296.4	4356	.222*	.069*	-.023*	-.077*	-.005*	-.002	-.003	.023*	-.009*	-.033*	-.036*	-.015*	1.00			
14	34.78	76.61	.026*	.052*	.249*	.049*	-.002	-.002	-.000	-.014*	-.014*	-.130*	.007*	-.039*	.004*	1.00		
15	1493	1408	-.147*	-.209*	-.101*	.159*	.007*	.009*	-.000	.209*	.010*	.459*	.446*	.296*	-.039*	-.045*	1.00	
16	59.06	4.02	-.035**	-.053*	-.059*	.007*	.000	-.001	-.002	-.042*	-.069*	.110*	.131*	-.014*	-.018*	-.001	.059*	1.00

Note: *: significant at 1% level

(1) Return on sales (ROS); (2) Exit; (3) Labor size; (4) Economic size; (5) Debt ratio; (6) Capital intensity; (7) Innovation intensity; (8) SOE density; (9) COE density; (10) POE density; (11) FOE density; (12) MOE density; (13) Industry ROA; (14) Industry MES; (15) Population density; (16) PCI.

Variance Inflation Factor VIF

Variables	SOE density	MOE density	POE density	Labor size	Economic size	FOE density	Population density	Industry MES	PCI	COE density	Exit	Industry ROA	Capital intensity	Innovation intensity	Debt ratio
VIF	4.42	4.39	1.96	1.89	1.76	1.41	1.24	1.14	1.06	1.03	1.02	1.00	1.00	1.00	1.00
1/VIF	0.23	0.23	0.51	0.53	0.57	0.71	0.81	0.94	0.97	0.98	0.99	0.99	0.99	0.99	0.99

Table 2: GMM Model of Organizational Forms and Firm Performance

Variable	SOE			MOE			POE		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ROS_{t-1}	-0.015**	-0.013**	0.275**	-0.014*	-0.013**	0.183**	0.011**	0.013**	0.018**
	(0.004)	(0.004)	(0.009)	(0.007)	(0.007)	(0.012)	(0.001)	(0.001)	(0.001)
SOE density, t-1	0.001**	0.001	0.000*	0.001*	0.004**	0.002*	-0.002**	-0.003**	-0.002**
	(0.000)	(0.001)	(0.000)	(0.0003)	(0.001)	(0.001)	(0.000)	(0.0001)	(0.000)
SOE density squared, t-1		-0.000	-0.000		-0.000**	-0.000*		0.000**	0.000
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
MOE density, t-1	-0.001*	-0.001*	-0.001*	0.001*	0.001**	0.001*	0.001**	0.001**	0.007**
	(0.000)	(0.000)	(0.000)	(0.0003)	(0.000)	(0.000)	(0.000)	(0.0001)	(0.000)
MOE density squared, t-1		0.000	0.000		-0.000**	-0.000**		-0.000	-0.000**
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
POE density, t-1	-0.0001**	-0.0001**	-0.000**	-0.000*	-0.000	-0.000*	-0.000**	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
POE density squared, t-1		0.000	0.000*		0.000	0.000**		-0.000**	-0.000**
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
SOE density * MOE density	-0.000**	-0.000**	-0.000*	-0.001**	-0.000**	-0.000*			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)			
MOE density * POE density				-0.000**	-0.000**	-0.000	0.000*	0.000**	0.000**
				(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SOE density * POE density	-0.000**	-0.000**	-0.000*				-0.000**	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)
COE density, t-1	0.001**	0.001**	0.000	-0.0001	-0.0003	-0.0001	-0.0001**	-0.0001**	-0.000
	(0.000)	(0.000)	(0.000)	(0.0001)	(0.0001)	(0.0001)	(0.000)	(0.000)	(0.000)
FOE density, t-1	-0.001**	-0.001**	-0.001**	-0.0004*	-0.0004*	-0.0006**	-0.0001**	-0.000*	-0.0001**
	(0.001)	(0.000)	(0.000)	(0.0002)	(0.0002)	(0.0001)	(0.000)	(0.000)	(0.000)

Variable	SOE			MOE			POE		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PCI			-0.007*			0.001*			0.002**
			(0.004)			(0.0005)			(0.000)
PCI * MOE density			-0.001*			-0.000			0.0001**
			(0.000)			(0.000)			(0.000)
Firm labor size	-0.008*	-0.007	-0.029**	-0.008	-0.007	-0.004	0.018**	0.018**	0.017**
	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)	(0.000)	(0.0004)	(0.000)
Firm economic size	-0.039**	-0.039**	-0.003	-0.007*	-0.005	-0.012**	0.016**	0.016**	0.018**
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.000)	(0.0002)	(0.0002)
Debt ratio	-0.004**	-0.004**	-0.000**	0.000**	0.000**	0.000**	0.000**	0.000**	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Capital intensity	-0.000**	-0.000**	-0.000*	-0.000**	-0.000**	-0.000	0.000**	0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Innovation intensity	-0.001*	-0.001*	-0.000*	-0.000	-0.000**	-0.000*	0.000*	0.000*	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)
Industry ROA	0.000**	0.000**	0.000	0.000**	0.000**	0.000	0.000**	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry MES	0.0003**	0.0002**	0.000*	0.0002**	0.0002**	0.0001	0.000**	0.000**	0.000**
	(0.0001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.0001)	(0.000)	(0.000)	(0.000)
Population density	-0.000**	-0.000**	-0.000**	-0.000*	-0.000**	-0.000*	-0.000**	-0.000**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Location	2.659**	3.071**	-0.548**	-0.071	-0.088	-0.088	-0.257**	-0.267**	-0.282**
	(0.147)	(0.144)	(0.154)	(0.074)	(0.066)	(0.082)	(0.004)	(0.004)	(0.004)
Intercept	-0.382**	-0.449**	0.013	0.150**	0.123**	0.088	-0.041**	-0.066**	-0.037**
	(0.056)	(0.055)	(0.068)	(0.048)	(0.049)	(0.061)	(0.003)	(0.003)	(0.005)
Observations	41,500	42,029	22,428	15,482	15,482	11,518	1,567,339	1,567,339	1,347,616
Wald $\chi^2()$	$\chi^2(17)$ = 8707**	$\chi^2(19)$ = 8141.4**	$\chi^2(21)$ = 1462.7**	$\chi^2(17)$ = 2747.2**	$\chi^2(19)$ = 2790.8**	$\chi^2(21)$ = 434.6**	$\chi^2(17)$ = 86211**	$\chi^2(17)$ = 86747.5**	$\chi^2(21)$ = 21055**

Note: * significant at 1% level; **: significant at 5% level. Robust standard errors are in parentheses.

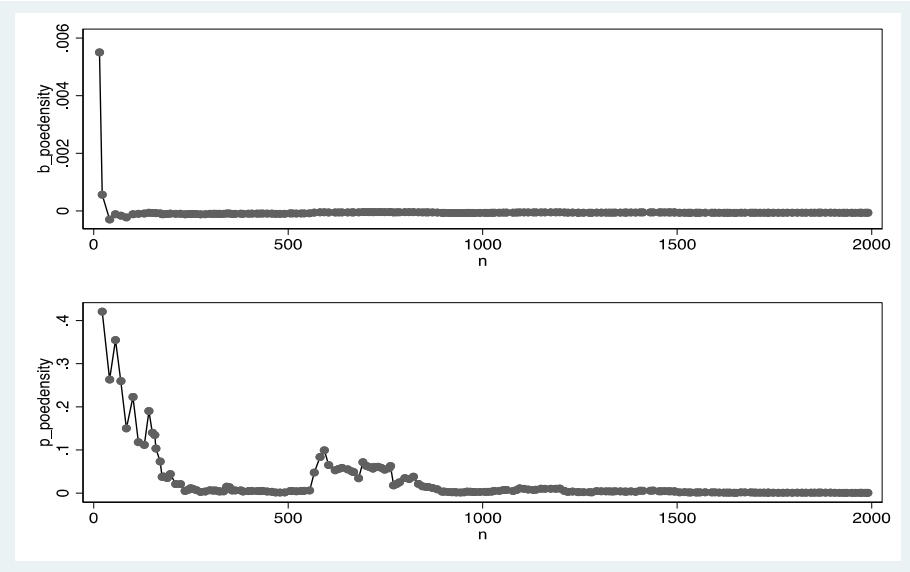
Table 3: Piecewise Exponential Hazard Model of Organizational Forms and Firm Exit

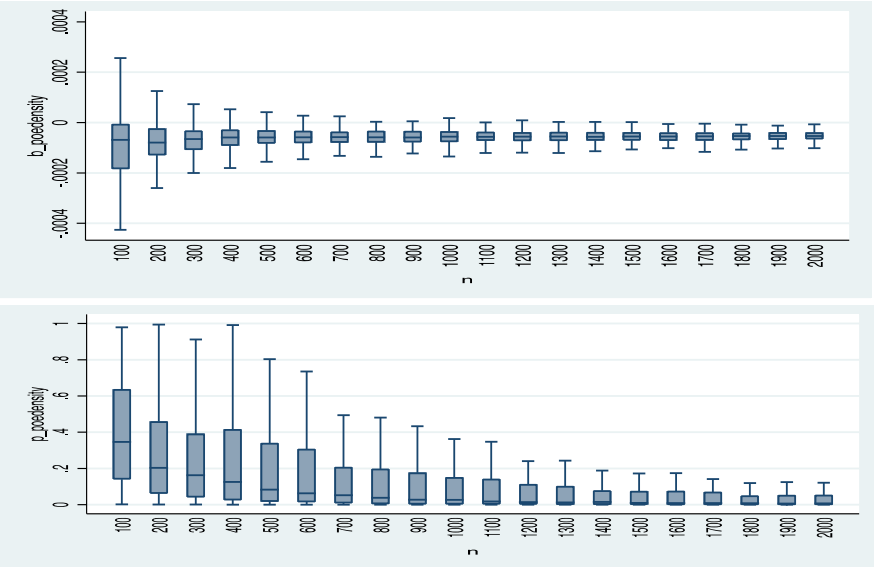
Variable	SOE			MOE			POE		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Firm profitability (ROS)	-0.510**	-0.525**	-0.518**	-0.534**	-0.571**	-0.584**	0.285**	0.291**	0.259**
	(0.133)	(0.132)	(0.142)	(0.175)	(0.176)	(0.177)	(0.013)	(0.013)	(0.013)
SOE density, t-1	0.007	0.019	0.019	-0.010	-0.032*	-0.029*	0.001	0.016**	0.026**
	(0.007)	(0.016)	(0.017)	(0.013)	(0.019)	(0.011)	(0.001)	(0.001)	(0.002)
SOE density squared, t-1		-0.0001	-0.0002		0.000	0.0002		-0.001**	-0.002**
		(0.0001)	(0.0003)		(0.001)	(0.001)		(0.000)	(0.0001)
MOE density, t-1	0.007	0.022**	0.038*	-0.011*	-0.032**	-0.083**	-0.007**	-0.004**	-0.143**
	(0.006)	(0.008)	(0.033)	(0.005)	(0.008)	(0.025)	(0.001)	(0.001)	(0.003)
MOE density squared, t-1		0.0001**	0.0001**		0.0002*	0.0002*		0.0001**	0.0002**
		(0.000)	(0.000)		(0.0001)	(0.0001)		(0.000)	(0.000)
POE density, t-1	0.0001	0.0001**	0.0001**	0.0002**	0.000	0.0001	-0.0001**	0.0001**	0.0001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
POE density squared, t-1		-0.000	-0.000		-0.000	-0.000		-0.005**	-0.000**
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
SOE density *MOE	0.000	-0.0001	-0.0002	-0.0001	-0.0004	-0.0004			
density, t-1	(0.000)	(0.0003)	(0.0003)	(0.0001)	(0.0006)	(0.0006)			
MOE density *POE				0.000**	0.000**	0.000**	0.000**	0.000**	0.000**
density, t-1				(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SOE density * POE	0.000	0.0001	0.000				0.000**	0.000**	0.000**
density, t-1	(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)
COE density, t-1	0.0023**	0.0023**	0.002**	0.0009	0.0005	0.001	0.006**	0.006**	0.006**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.0001)	(0.0002)	(0.0002)
FOE density, t-1	0.0015	0.001	0.001	0.001	0.0005	0.001	-0.0001	-0.0002*	-0.006**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)

Variable	SOE			MOE			POE		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PCI			0.001			-0.032**			-0.024**
			(0.006)			(0.009)			(0.001)
PCI * MOE density			0.001*			0.001*			-0.003**
			(0.0005)			(0.0004)			(0.0001)
Firm labor size	-0.546**	-0.546**	-0.549**	-0.391**	-0.376**	-0.386**	-0.337**	-0.328**	-0.332**
	(0.038)	(0.038)	(0.038)	(0.042)	(0.042)	(0.042)	(0.004)	(0.004)	(0.004)
Firm economic size	0.069**	0.077**	0.081*	0.188**	0.192**	0.206**	0.049**	0.046**	0.048**
	(0.026)	(0.026)	(0.025)	(0.031)	(0.032)	(0.032)	(0.002)	(0.003)	(0.003)
Debt ratio	0.0001*	0.0001*	0.0001*	0.000*	0.000**	0.0001**	0.000**	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Capital intensity	0.000**	0.000**	0.000**	0.000	0.000	0.000	0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Innovation intensity	-0.000	-0.000	-0.0001	-0.000	-0.000	-0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry ROA	0.0003**	0.0003**	0.0002**	-0.0003**	-0.0003**	-0.0002**	0.000**	0.000**	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Industry MES	-0.0001	-0.0001	-0.0003	0.0006	0.001	0.001	0.001**	0.001**	0.001**
	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.001)	(0.0005)	(0.000)	(0.000)	(0.000)
Population density	0.0001	0.000	0.000	0.0002**	0.0002**	0.0002**	0.000**	0.0001**	0.0001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Location	0.163	0.178	0.232*	-0.399**	-0.422**	-0.368*	0.047**	-0.033**	0.065**
	(0.129)	(0.127)	(0.133)	(0.152)	(0.154)	(0.159)	(0.009)	(0.009)	(0.011)
Observations	32,135	32,135	32,135	19,851	19,851	19,851	1,757,608	1,757,608	1,757,608
Likelihood ratio $\chi^2()$	$\chi^2(23)$ = 13618**	$\chi^2(26)$ = 13549**	$\chi^2(28)$ = 13538**	$\chi^2(23)$ = 8830**	$\chi^2(26)$ = 8773**	$\chi^2(28)$ = 8740**	$\chi^2(23)$ = 1003242**	$\chi^2(26)$ = 937622**	$\chi^2(28)$ = 920465**

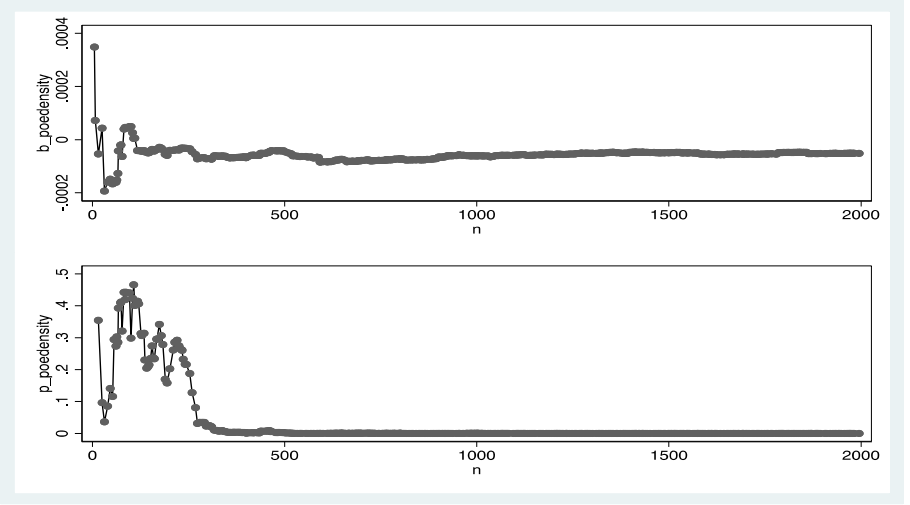
Note: * significant at 1% level; **: significant at 5% level. Standard errors are in parentheses.

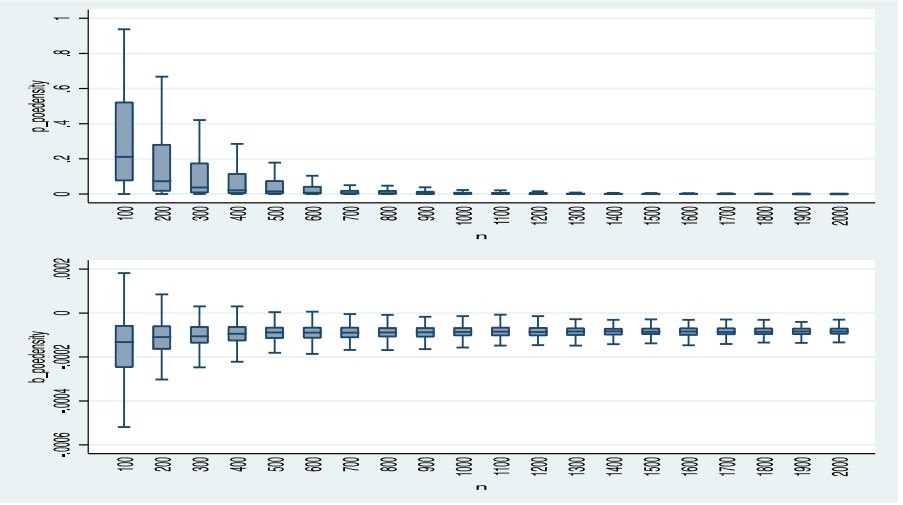
Appendix A: CPS Chart (left) and CPS Monte Carlo Chart (right) for POE density: Coefficient and p-Value vs. Sample Size



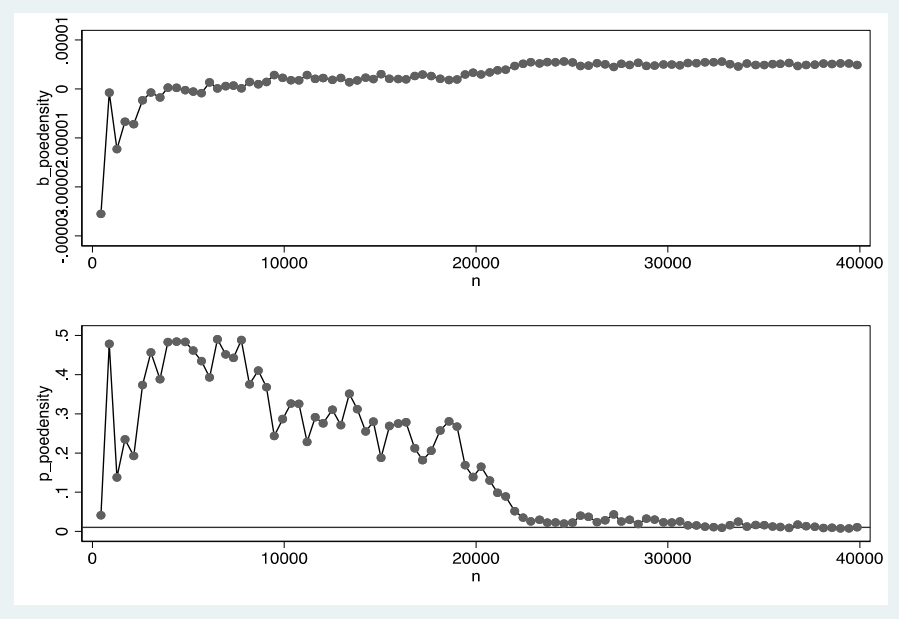


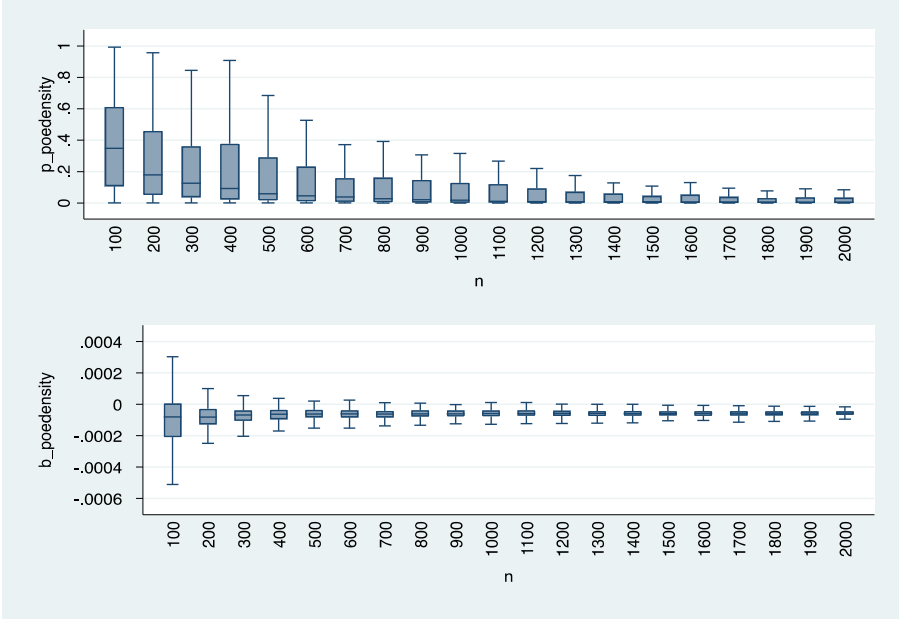
A1: SOE Survival Equation – Note: CPS chart was zoomed in to *n*<2,000 for illustration





A2: SOE Performance Equation – Note: CPS chart was zoomed in to *n*<2,000 for illustration





A3: POE Performance Equation – Note: CPS chart was zoomed in to *n*<40,000 for illustration. Horizontal dashed line corresponds to p=0.01.