The Marriage of Politics and Economy: Elite Fusion in the Age of Modernization*

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Abstract

Modern state-building brings profound political and economic transformations, challenging established elites and opening doors for emerging ones. While previous empirical studies have explored feudal elites' persistence and emerging elites' struggles, limited research has examined *how* emerging elites integrate into existing elite networks. This study investigates the responses of old and new elites during modernization. By constructing a unique dataset detailing kinship connections among Japanese elites in 1902, 1914, and 1927, we revealed shifts in elite kinship networks and their influence on controlling political and economic resources. The findings indicate that modernization transformed the Japanese elite community, with many commoners becoming elite by 1902. Nonetheless, these new elites often found themselves isolated within that community as they lacked kinship ties with other elites. Conversely, peerage political elites already held centrality in the elite kinship network in 1902, and their influence continued to grow over time. However, by 1927, the new economic elites, initially without kinship networks, had managed to establish connections within the elite community, leading to the emergence of an expanded and hierarchical elite community, blending the old and new elites, in which an individual's centrality in the network became closely linked to his/her political or economic position.

Keywords:
Modern state-building, Elite, Kinship network, Modernization, Network analysis

* We would like to thank Tomoko Masuda, Tomoya Sano, and Haruo Iguchi, for valuable support on earlier drafts, including the construction of the dataset, and Jacques Hymans, Sawako Shirahase, Junichi Yamasaki, and the participants of the TCJS seminar of the University of Tokyo for their comments on earlier drafts. We also acknowledge the assistance of Tomohiro Kishino, Haruki Kitagawa, Akari Umezawa, and Saeri Yoshida in the formatting of the dataset. All remaining errors are our own. This research project is financially supported by the JSPS Kaken Project Grant Number 16H01998 and 21H04391, the JALII project at Nagoya University, the Canon Institute for Global Studies, and the Nomura Foundation.

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Introduction

Modernization involves profound political and economic transformations [1], and these transformative processes pose a significant challenge for established elites while providing an opportunity for emerging elites, particularly the bourgeoisie, to establish themselves in society. The central inquiry pertains to how these old and new elites responded to these transformations under modernization. Empirical studies mainly conducted in Britain have revealed that many feudal lords (imperial/royal/noble political elites or aristocrats) survived and maintained their economic status through this process (Cain and Hopkins 1993a, 1993b; Matsumoto and Okazaki 2023). Moreover, in terms of politics, while modernization fostered an extension of suffrage in many countries, data indicate a significant time lag before non-aristocratic political elites could attain prominent positions (e.g., Berlinski et al. 2014; Guttsman 1951; Laski 1928).

It is noted that the old elites who maintained their status had kinship networks within a high society, and recent studies stress the role of marriage as a device to make and expand their kinship networks (e.g., Botticini 1999; Cassis 1994; Choi, Chung, and Breen 2020; Dribe and Lundh 2009; Fernihougha, Gráda, and Walsh 2015; Lam and Schoeni 1994; Lebra 1993; Nakaoka 2022; Padgett and McLean 2006). This role of marriage could be even more pronounced in the context of modernization, where both longstanding and emerging elites may strategically utilize marriage as a tool for preserving or attaining elite status. Thus, an examination of the shifts in elite kinship networks during the modernization process provides valuable insights into the dynamic interplay between the established and emerging elites.

Given the insights of these studies, we explore the evolution of elites and their kinship networks and thereby assess the durability/changeability of elite communities under modernization. To this end, we constructed a unique dataset on kinship ties among individual Japanese elites in the early twentieth century (1902, 1914, and 1927), when Japan was undergoing economic and political modernization, that is, modern economic development and voter expansion. Focusing on Japan offers an advantage for addressing this issue. First, elimination of segregation between social strata and the modernization process occurred simultaneously in Japan, which enables us to clearly distinguish old elites from new elites. In the feudal era before the Meiji Restoration in 1868, Japanese society was strictly segregated into several strata, namely aristocrats, *samurai* (warriors), and ordinary people, who were composed of peasants, craft men, and merchants. *Samurai* did not engage in business and commoners could not participate in politics. Cross-stratum marriages were exceptional. After the Meiji Restoration, this strict stratum system was abolished, and people became able to choose their occupations and marriage partners without government restrictions. At the same time, Japan began economic and political modernization by adopting various institutions and technologies from Western countries.

Moreover, compared to Western countries, Japan is distinct in that consistent quantitative and qualitative data covering the entire process of modernization, including the early stages, are available. Although the first data point of this paper, 1902, is 34 years after the Meiji Restoration, it was just eleven years after the foundation of the Imperial Diet. Also Japan's per capita GDP in this year was smaller than that of the United Kingdom in 1700; by 1927, the last data point of this paper, Japan achieved universal manhood suffrage, and Japan's per capita GDP became as large as that of the U.K. in the 1830s and 1840s, when it had already gone through the Industrial Revolution.[2] Hence, we can consistently observe the evolution of the elite community as an essential part of the modernization process by exploiting data from Japan.

To preview the results, we first found that political and economic modernization changed the elite community in Japan in that many commoners became members by 1902. However, most new elites did not have kinship networks in the community; in this sense, they were isolated. By contrast, peerage political elites already had high centrality in the community in 1902, and their centrality continued to grow over time. Meanwhile, the new economic elites, who did not have kinship networks in 1902, entered the kinship networks of the elite community by 1927. By that year, an extended elite community had emerged, fusing old and new elites. This community had a hierarchical structure in which the centrality of each elite in the elite kinship network was associated with her/his political or economic position.

This study is related to the following four strands of the literature: First, it is related to the long-term durability of social status. Economic and social status tends to be transmitted from parents to children (e.g., Corcoran 1995; Mazumder 2005; Solon 1992). In the realm of sociology and economics, the conventional approach to evaluating intergenerational durability/mobility is to analyze the socioeconomic correlation between fathers and their sons (e.g., Ager et al. 2021; Barone and Mocetti 2021; Blau and Duncan 1967; Clark 2014; Cummins 2022; Dribe and Helgertz 2016; Knigge et al. 2014; Lindahl et al. 2015; Long and Ferrie 2013; Padgett and Ansell 1993; Padgett and McLean 2006; Song et al. 2015). Recent studies have extended this examination to include the influence of maternal kinship (e.g., Chadwick and Solon 2002; Hällsten and Pfeffer 2017; Hirvonen 2008; O'Brien following; Olivetti and Paserman 2015; Toft and Friedman 2021). Our study adds insights into the relationship between elite kinship networks and the low intergenerational durability of status.

Second, this study contributes to the literature on state building, in which one central inquiry revolves around whether elites impede economic, social, and political development. A prevailing perspective suggests that state-building represents a shift from kinship-based organizational structures to state-level frameworks (Fukuyama 2011:51). This perspective posits that elite kinship networks hinder state-building and modernization. In the classical article, Weber (1915, 1951:237) contends that states need to break free from the constraints imposed by extended family ties.

According to Migdal (1988:269), robust states emerge only when significant disruptions weaken traditional kinship-based institutions. More recently, Lachmann (2009) argued that self-serving behaviors among elites weakened European great powers and obstructed reform efforts. Acemoglu and Robinson (2019) characterized communities with strong kinship-based institutions as inhibiting the development of a strong central authority. Meanwhile, some recent scholars have cast doubt on such arguments and instead emphasized the importance of elite kinship networks in the early construction of modern states (e.g., Adams 1999, 2007; Peng 2004; Wang 2022). Nevertheless, these discussions do not provide sufficient insights into how elite kinship networks adapt and evolve in response to changing environments.

Third, this study relates to the literature on elite compromise during a regime change. Previous political literature argues that the sharing of power between old and new elites plays a pivotal role in establishing democratic regimes (e.g., Higley and Burton 1989; Higley and Moore 1981; Huntington 1991; Karl and Schmitter 1991; Linz and Stepan 1996; O'Donnell and Schmitter 1986; Przeworski 1985; Rustow 1970) but also authoritarian regimes (e.g., Albertus and Menaldo 2012; de Mesquita et al. 2003; Gandhi and Przeworski 2007; Svolik 2009; Wright 2008). Although some studies have analyzed the mobility of political elites during regime change (e.g., Matsumoto and Okazaki 2023), there is limited knowledge regarding how such elite compromise influences the interconnection of old and new elite kinship networks. Our research endeavors to unveil the transformations that occurred within elite kinship networks during this transitional period.

Finally, this study contributes to the literature on the history of the Japanese elite community during the period of modernization, beginning with the Meiji Restoration in 1868. Existing research on the Meiji Restoration presents varying evidence of elite mobility. Takane (1976, 1981) found that both traditional factors (such as fathers' positions in the feudal regime) and modern factors (such as education) influenced political elites in the modern era; however, modern factors gained importance over time. Sonoda (1990, 1993) shows a decline in the samurai class after the regime change. In contrast, Clark and Ishii (2013) underscored elite continuity during regime changes using rare surname data. Matsumoto and Okazaki (2023) illustrated the differing short- and long-term effects of the Meiji Restoration on political elite mobility. While these studies primarily concentrated on paternal kinship, Lebra (1993) and Nakaoka (2022) examined elite marriages during this era, revealing an increase in marriages between the wealthy economic elite and the aristocracy. Building on these studies, our research highlights the changes in elite kinship networks from 1902 to 1927, encompassing both paternal and maternal kinship, and examines the effects of these networks on the positions of economic and political elites.

The remainder of this paper is organized as follows: Section 2 describes the historical background and focuses on the modern political and economic development in Japan; Section 3 describes the data used in the study; Section 4 visualizes networks in an elite society using network

analysis; Section 5 examines the internal structure of elite networks using regression analysis; and, Section 6 concludes.

Historical background

Japan's modernization took place during the late 19th and early 20th centuries. Japan transitioned from a feudal society to a modern industrialized nation during a period of rapid political and economic transformation.

Modern Political Development

The process was initiated in 1868 with a regime change referred to as the Meiji Restoration, in which political power was centralized under Emperor Meiji. The new Meiji government swiftly initiated numerous social and economic changes. In 1870, it granted commoners the right to possess family names that were previously exclusive to the samurai class. By 1871, when feudal domains were replaced by prefectures, the government also bestowed people with the freedom to choose their residence, occupation, and marriage partner regardless of social strata.

Concurrently, the government embraced an array of reforms to catch up with the Western powers. These encompassed the adoption of Western-style legal codes, a comprehensive military overhaul, active engagement in industrialization and technological progress, and the promotion of education and modern science. Meanwhile, as the costs of these reforms escalated, the government fortified the tax collection system, exacerbating the discontent among taxpayers. Together with disgruntled samurai, these taxpayers demanded political participation instead of tax payments, thus driving the Movement for Civic Rights and Freedom during the 1870s and the 1880s.

In response, in 1881, the government committed to establishing the Diet and enacting the Constitution by 1890, endorsed by an imperial decree. The Constitution encompasses key elements of a modern state's constitution, including the safeguarding of property rights and the Diet's oversight of taxes and government budgets (Banno 1971; Gordon 2002:92–93; Maeda 2018).

The Diet consists of two chambers: the House of Lords and the House of Representatives. The House of Lords comprises of members of the Imperial Family Council, the Peerage Council, and individuals appointed by the emperor. In anticipation of the formation of the House of Lords, the government introduced a peerage system in 1884, which included five ranks: duke, marquis, count, viscount, and baron. Those who had been former feudal lords, distinguished samurai, and aristocrats, and those who had played a significant role in the Restoration were nominated for peer positions. All imperial families, dukes, and marquises were designated members of the House of Lords and counts, viscounts, and barons were elected to this chamber. Emperor-appointed

members are selected from a pool of former bureaucrats, past ministers, prominent business figures, academics, military leaders, and leading taxpayers.

In contrast, members of the House of Representatives were designated through a general election involving men aged 25 years or older. However, in the first House of Representatives election in 1890, a limited franchise was in place, allowing only men who had paid a direct national tax of 15 yen or more (constituting approximately 1.1% of the population) to participate in the election. Nevertheless, subsequent amendments to election laws in 1900 and 1919 reduced the tax amount required for suffrage eligibility. Ultimately, universal male suffrage was granted through 1925 amendments.

Modern Economic Development

Modern economic development has progressed under the new political regime. Economic growth accelerated in Japan after the regime changed. While the average annual growth rate of per capita real GDP was 0.41% from 1850 to 1870, just before the regime change, it became 1.60% from 1870 to 1890 and 1.28% from 1890 to 1910. As Figure 1 shows, the Japanese economy continued to grow until the end of the 1930s, immediately before World War II. Industrialization was the driving force of economic growth. In 1885, the value-added of the mining and manufacturing industries accounted for only 12.1% of GNP, but their share maintained an upward trend after that, reaching 46.5% in 1940 (see Figure 1). While the textile industry, such as silk reeling, cotton spinning, and weaving, led industrialization until the 1900s, heavy and chemical industries developed during and after World War I. Along with industrialization, various infrastructures, such as railways, marine shipping, electricity, and banking developed.

[Insert Figure 1 here]

The development of these industries was associated with the rise of new organizations, particularly corporations. The National Bank Law of 1872 prescribed the corporate form of private banks, and the Commercial Code of 1890 and 1899 provided a general legal framework for corporations (Miyamoto 1990). Figure 2 provides an overview of the development of Japanese corporations. Corporations paid-in capital grew steadily until the early 1910s, and since then growth has accelerated. The high growth of corporate capital from the 1910s reflects not only the economic boom during World War I but also the tax reforms that provided incentives for incorporation.

[Insert Figure 2 here]

Corporate income tax was introduced by a tax reform in 1899. While the corporate income tax rate remained constant at 2.5%, individual income tax increased from 1% to 5.5%. Following the tax reforms of 1913, while the income of a joint-stock company was maintained at a constant rate of 6.25%, the tax rate for partnership income progressively increased from 4% to 13%, and

the tax rate for individual income progressively increased from 2.5% to 22%. Hence, the 1913 tax reform urged individual businesses and partnerships to be incorporated into joint-stock companies to generate a wave of incorporation (Miyamoto 1990; Tax Bureau of the Ministry of Finance 1988).

This wave of incorporation included the organizational reforms of large business groups. Since the early stages of modern economic development in Japan, several wealthy families such as Mitsui, Iwasaki, and Sumitomo have invested in multiple businesses. From the 1900s, these families incorporated each of their businesses and founded holding companies, so that the holding companies owned the majority of the shares of affiliated companies. Business groups with holding companies as headquarters are called *zaibatsu* (Miyamoto 1990; Okazaki 2001).

Data

Network analysis is a prevalent approach in the study of how elites manage social resources (e.g., Davis, Yoo, and Baker 2003; Hillmann 2008; Moore 1979; Useem 1979), among which some studies concentrate on elite kinship networks (e.g., Fang 2022; Padgett and Ansell 1993; Peng 2004; Wang 2022). Following this tradition, we constructed a unique dataset of an undirected network with weighted edges to analyze the changes in elite networks during Japan's modernization. This section elaborates on the procedure illustrated in Figure 3.

[Insert Figure 3 here]

The network dataset consists of two datasets: vertex and edge data. Vertex data store the elite's information, whereas edge data store each relation (i.e., edge) between the vertices and the weight of the relation.

To construct such datasets, we utilized two original documents of the time: *Jinji Kōshinroku* and *Nihon Zenkoku Shokaisha Yakuinroku*. *Jinji Kōshinroku*, known as the most credible Who's Who Record during the period (e.g., Aso 1978; Matsumoto and Okazaki 2023; Takane 1976, 1981). It provides information on each elite member, including their peerage ranks, medals of order, occupations, birth years, names of relatives by blood and marriage, and their relations with such relatives. This detailed kinship information is unique for the *Jinji Kōshinroku* in contrast to other Who's Who Records such as *Nihon-Shinshi-Roku* and the elite lists composed by Hata (1981, 2001). *Nihon Zenkoku Shokaisha Yakuinroku* provides information on each company's paid-in capital and directors' names.

Identification of elites and construction of vertex data

In this research, we assume that an elite consists of political elites and economic elites; the political elite shall have at least one of the following three positions during a year: cabinet minister[3], member of the House of Lords,[4] member of the House of Representatives; and the economic elite shall have an auditor or higher position in the top 100 companies of the year.[5]

Because this paper focuses on the impact of industrialization, agricultural landlords are not included from the list of our economic elites. The information on the political positions was extracted from *Jinji Kōshinroku*. Contrarily, with regard to the information on business, we followed the following steps: first, we extracted data on the paid-in capital[6] of all companies from *Nihon Zenkoku Shokaisha Yakuinroku* and identified the top 100 companies whose paid-in capital was ranked within the top 100 for the year. In 1902, because 27 companies with a paid-in capital of 1 million yen were the 86th largest, the list included 114 companies. In addition, for 1914, because eight companies with paid-in capital of 3 million yen were the 99th largest, the list included 106 companies, and for 1927, because 10 companies with a paid-in capital of 20 million were the 93rd largest, the list included 102 companies. In what follows, we refer to these companies as the Top 100 for simplicity. We recorded all names of those with an auditor or higher position in the top 100 companies and regarded them as economic elites. We then recorded the profile information of these political and economic elites (i.e., vertices), as shown in the two documents above, on the vertex data in the manner displayed in Figure 3.

Table 1 classifies the top 100 companies by industry and shows their aggregate paid-in capital. At the bottom of the table, we compare the total paid-in capital of the top 100 companies with that of all the companies in Japan. The total paid-in capital of the top 100 companies and that of companies in Japan increased rapidly, and the top 100 companies accounted for 34.6%, 39.6%, and 35.1% of the total paid-in capital of companies in Japan in 1902, 1914, and 1927, respectively.

[Insert Table 1 here]

The positions of the industries within the top 100 companies changed over time. In 1902, two industries that provided infrastructure for the economy, namely railways and banks, accounted for approximately 70% of the total paid-in capital of the top 100 companies, indicating that industrial development was still in its early stages. Among the manufacturing industries, the textile industry, mostly comprising of cotton-spinning companies, had the largest share. In 1914, the percentage of railways declined substantially because of the nationalization of major railroads in 1906. Electricity and gas, which also provide infrastructure for the economy, have come to have a large share. In the early twentieth century, electrification proceeded rapidly in Japan based on long-distance power transmission technology and the development of hydraulic power plants (Minami 1987). Finally, in 1927, while electricity and gas maintained a large share, holding companies became the second largest category, reflecting the formation of *zaibatsu* business groups. Simultaneously, owing to industrialization, the percentage of manufacturing industries increased.

Construction of edge data

Next, we constructed edge data to record the relationships (by blood and marriage) among the elites (i.e., vertices). *Jinji Kōshinroku* recorded the names of an elite's relatives listed in the

same volume (as shown in Figure 3) and we can obtain the specific relation of the elite with a listed relative from the columns of her/his family and biography. In this manner, we specified each relationship (i.e., edge) between elites.[7]

When recording an edge, we assigned a weight to each edge based on the closeness of the relationship between two persons. The closeness in turn is measured by the "degree of kinship," that is the number of steps or generations that separate two individuals from their common ancestor, as displayed in the upper right side of Figure 3. This denotes the kinship (a blood relationship and a relationship by affinity) between two individuals who share a common ancestor. For example, the degree of kinship between a person and her/his mother, father, mother-in-law, and father-in-law is 1, while the degree of kinship between a person and her/his aunt, uncle, aunt-in-law and uncle-in-law is 3. Details on the identification of the degree of kinship for each relationship are shown in Figure 3.

In addition, during this period, elites often employed strategies such as arranging marriages between their children (or sisters/brothers or nephews/nieces, etc.) to establish relationships with other elites they wanted to strengthen their ties with; relationships by affinity were important. Thus, we took such indirect relations into consideration as well. The incorporation of indirect kinship relationships through marriages into the kinship network has significance for two primary reasons within the context of this study. Firstly, having a substantial number of children was recognized as a strategic means of expanding familial influence. These descendants were strategically wedded to enhance the family's influence at that time. Secondly, in instances where a family did not experience a proliferation of biological offspring, concerted efforts were often undertaken to augment influence through adoption and strategic marriage of the adopted relatives. Consequently, the decision not to confine kinship ties exclusively to biological descendants serves the additional purpose of controlling the uncertainty regarding the abundance of children. The recognition of such distant relatives as integral members of one's kinship network is substantiated by their inclusion in personal profiles within prestigious publications such as Who's Who.

Let us illustrate how we calculate the kinship degree using an example that presents the right side of Figure 3: B is A's aunt in law of father in law of child. In this case, there are three steps needed to connect between the two persons. Thus, we calculated the degree of relation by summing the product of the order of each relation and its kinship degree from both the A and B sides and taking the average. The weight of each relationship (edge) is the inverse of the degree of kinship, such that a larger value represents a tighter relationship.

Visualizing the elite network

Building on the methodology described in the preceding section, we constructed three datasets of elite networks for 1902, 1914, and 1927. The data sources for the elite networks in 1902, 1914, and 1927 are *Jinji Kōshinroku* (*Who's Who*) published in 1903, 1915, and 1928, respectively as well as *Nihon Zenkoku Shokaisha Yakuin-roku (Directory of Companies around Japan)* published in 1903, 1915 and 1928, respectively. The 1902 elite network dataset included 849 elites (vertices) with 321 relations (edges) between vertices. The 1914 elite network dataset included 1,286 elites (vertices) with 1,205 relations (edges) between vertices. The 1927 elite network dataset includes 1,675 elites (vertices) with 2,008 relations (edges) between the vertices.

Characteristics of the elites

The 849 elites in the 1902 dataset comprised of 669 political and 228 economic elites. Similarly, in the 1914 data set, of the 1,286 elites, there were 739 political and 608 economic elites. In the 1927 dataset containing data on 1,675 elites, there were 871 political and 871 economic elites. The details of each elite member are listed in Table 2. (The presence of elites belonging to both the political and economic categories, and/or more than one political subcategory, should be noted.)

[Insert Table 2 here]

An important focus of this study is how non-elites participated in elite communities during this period. To examine this, we categorized political elites into two groups: commoner politicians and politicians from imperial families or peerage.[8] The categorization of elites, along with the respective counts of elites falling under each category, is presented in Table 3.

[Insert Table 3 here]

The kinship relations between elites

Using the data, we first provide an overview of the evolution of networks aggregating elites into five categories: economic elites (E), politicians of the imperial family or peerage (FP), commoner politicians (NFP), and their combinations, E cum FP and E cum NFP. Table 4 presents the aggregate number of edges within each category and between different categories. The degree of kinship is *not* counted here. The number of edges within each category was in the diagonal cells of the matrix, whereas the number of edges between different categories was in the non-diagonal cells of the matrix. To observe the evolution of the network by summarizing the information, we further aggregated the numbers of edges into those within categories and those between different categories, and then divided them by the number of persons for comparison across years.

[Insert Table 4 here]

Panel A of Figure 4 presents the results. We found that the network became denser between 1902 and 1927. Although both the edges within a category and those between different categories

contribute to the development of networks, the contribution of the latter is greater. Indeed, the percentage of edges between categories was 43.4 in 1927, whereas it was just 22.1 in 1902. Panels B and C in Figure 4 show the composition of the edges within each category and those between different categories. Panel B indicates that most of the within-category edges were among politicians of the imperial family and peerage. In other words, the traditional upper class has a dense internal network. Meanwhile, the economic elites expanded their internal network during the observation period, and their share in the total within-category network increased substantially. In Panel C, we find that the large increase in the edges between different categories was driven by those between E and FP, between FP and E cum FP, and between E and NFP, implying that economic elites, in a broad sense (including E cum FP), led to the expansion of networks with different categories.

[Insert Figure 4 here]

Visualization of the elite network

Next, we visualize the elite networks in 1902, 1914, and 1927. We calculated the eigenvector centrality scores for each vertex (elite). Eigenvector centrality estimates the influence of an elite by considering not only the number of edges and the weights of the edges that she/he has, but also the influence of the vertices that she/he connects. Specifically, the formula for eigenvector centrality x_i of vertex *i* with weighted edges can be represented as $\mathrm{x_i} = \frac{1}{\lambda}\sum_{\mathrm{j}\in \mathrm{N(i)}} \frac{\mathrm{w_{ij}}}{\mathrm{w_j}} \cdot \mathrm{x_j}$, where λ is a normalization factor; N_i represents the neighbors of vertex *i*; w_{ij} is the weight of the edge between vertices *i* and *j*; w_j is the sum of weights of edges connected to vertex *j*; and x_j is the eigenvector centrality of vertex *j*. We calculated the eigenvector centrality score of each vertex using *eigen_centrality* in *the R/igraph* package (https://r.igraph.org/index.html).[9]

By depicting the eigenvector centrality score as the size of a vertex and the closeness of each relationship between two elites as the width of the edge, we can capture the overall characteristics of the entire elite kinship network, as shown in Figure 5.

[Insert Figure 5 here]

Figure 5 first indicates an increasing trend of network density over time. Supporting this observation, the percentage of individuals with no relatives within the elite network (i.e., isolated vertices) decreased from 72.6% in 1902, to 62.2% in 1914, and 59.8% in 1927.

Second, it also shows that the vertices with high eigenvector centrality scores were dominated by politicians of the imperial family or peerage in 1902 and 1914. In other words, economic elites and commoner politicians were not influential in elite kinship networks during these years. Many politicians of the imperial family or peerage were also witnessed as influential

persons in 1927; however, multiple economic elites also had high eigenvector centrality scores, while a single commoner politician obtained a relatively high score.

As reported in Table 5, an examination of the categorical characteristics in terms of changes in the percentage of isolated vertices in each network reveals a similar trend. The proportion of isolated elites within the economic elite was higher than that found among politicians of the imperial family or peerage. Furthermore, the percentage of isolated points within commoner politicians was even higher than that in the aforementioned categories. This consistent trend holds across all observed years, although the proportion of isolated vertices in all categories decreased from 1902 to 1927.

[Insert Table 5 here]

Examining the kinship structure among highly influential elites in the network, Figure 6 displays the subnetwork of neighborhoods of the top 3 elites with the highest eigenvector centrality scores in each year. This figure indicates that most vertices in the 1902 subgraph hold positions as politicians of the imperial family or peerage. The same holds true for 1914 and 1927. Figure 6 also indicates the emergence of economic elites or commoner politicians in 1914, although their size was small. Furthermore, in 1927, Hachiroemon Mitsui of Mitsui Zaibatsu won the second-highest eigenvector centrality score among the elites, and many other economic elite vertices with high eigenvector centrality scores also appeared in the subgraphs.[10]

[Insert Figure 6 here]

Internal structure of elite networks

In this section, we examine how centralities within the elite kinship network were associated with positions in the political and economic worlds using regression analyses. Political and economic positions were measured using two outcome variables.

To measure the political position of the elite, we utilized a hierarchical order established within the Japanese Emperor's court, known as *Kyuchu-Sekiji*. This arrangement was instituted through the enactment of the Imperial House Law Act (*Koshitsu-Rei*) Number 1 in 1915 by the Meiji government. The *Kyuchu-Sekiji* system formally classified individuals based on their level of proximity to the Japanese Emperor, thereby highlighting those esteemed by the new government. This hierarchy encompasses a diverse range of elites, primarily politicians, civilian and military bureaucrats, businesspeople, academics, and artists. The ranks within *Kyuchu-Sekiji* were associated with positions across three dimensions: (a) current and past appointments,[11] (b) titles (*Shakui*), and (c) honors[12]. This categorization led to the classification of elites into 70 distinct ranks[13]. Titles and honors were established prior to 1902, and the resulting ranks were organized within the same hierarchical framework. We recorded the rank ($PolRank_i \in [0,70]$) in *Kyuchu-Sekiji* the larger value of which means the higher rank. On the other hand, the economic position

of an elite is measured by the logged value of the sum of the paid-in capital of the top 100 companies where she/he held a position of auditor or higher ($EconRank_i$).[14]

We are interested in whether and to what extent those central to the elite network held higher positions in the political and business worlds. To explore this, we ran the following regressions separately for three elite groups: FP (including E cum FP), NFP (including E cum NFP), and E (including E cum FP and E cum NFP). To measure an elite's centrality in an elite network, we first use the eigenvector centrality score defined above. We also control for those who belong to multiple categories, that is, E cum FP and E cum NFP. Finally, to control for the effect of age, we added a variable representing an elite's birthyear. The basic specifications are as follows:

$$Y_i = \beta_0 + \beta_1 EigenScore_i + \beta_2 EcumFP_i + \beta_3 EcumNFP_i + \beta_4 Birthyear_i + \varepsilon \ldots \quad (1)$$

where Y_i is $PolRank_i$ for analyzing political elites, and $EconRank_i$ for analyzing business elites. $EigenScore_i$ is the eigenvector centrality score for i, $Birthyear_i$ is the birthyear for i, and ε is the error term. We estimate Model (1) by using ordinary least squares (OLS).

Table 6 reports the estimated results. Panel A demonstrates that, for politicians of the imperial family or peerage, there was a consistent positive association between having a larger influence in the elite kinship network and holding higher political positions from 1902 to 1927. In contrast, when examining Panel B, it is evident that for commoner politicians, influence within the elite kinship network was not correlated with their political status. Meanwhile, Panel C reveals that, concerning economic elites, there was initially no correlation between holding influence in the elite kinship network and their economic standing in 1902. However, in later years (1914 and 1927), holding influence within the elite kinship network became correlated with their economic position.

[Insert Table 6 here]

In the analyses above, we focused on each elite's centrality in the entire elite network. Alternatively, we can calculate the eigenvector centrality for a network within each category of elites and that between different categories of elites, and separately estimate their implications in political and economic positions. Specifically, after excluding elites belonging to multiple categories (E cum FP and E cum NFP), we estimated an eigenvector centrality scores (hereinafter abbreviated as EigenScore) for each of the six networks, consisting of three networks composed solely of edges across two categories (FP and NFP, E and FP, E and NFP), and three networks composed solely of edges within the same category (FP, NFP, E): EigenScore across FP and NFP, EigenScore E and FP, EigenScore E and NFP, EigenScore among FP, EigenScore among NFP, and EigenScore among E. This allowed us to examine the type of influence the elite kinship network had on their political and economic positions. The estimated results are listed in Table 7.[15]

[Insert Table 7 here]

The results concerning politicians of the imperial family or peerage, reported in Panel A of Table 7, shows that what correlates with their high political status is the influence of the same imperial or peerage politician group within the kinship network. In contrast, for commoner politicians, we confirmed that none of the types of kinship relations had any correlation with their political status (see Panel B of Table 7).

Finally, examining Panel C of Table 7, which reports the results for the economic elites, we confirmed that in 1902, none of the types of kinship relations were correlated with their economic success. However, trends in 1914 and 1927 differed. In 1914, economic success was strongly correlated with the greater influence of kinship relations within the same economic elite group. However, in 1927, economic success was associated with a strong influence on relations with politicians of the imperial family or peerage.

Conclusion

This study examines the evolution of elite communities during modern state building and economic development in Japan. That is, we investigated the dynamics of the composition of political and economic elites and the kinship networks within them, focusing on the pivotal years of 1902, 1914, and 1927.

Several significant findings emerged. First, by 1902, many new political and economic elites appeared in elite communities, namely, non-peerage politicians and directors of large firms. In this respect, modernization transformed elite communities in Japan. However, while peerage political elites had dense kinship networks within them, most non-peerage political and economic elites did not have kinship networks either within them or with other categories of elites.

Second, peerage political elites increased their centrality in elite networks over time. They not only strengthened networks within them but also newly formed kinship ties with economic elites.

Third, for some elite categories, political or economic positions were associated with their centrality in the elite community. That is, for peerage political elites, centrality consistently correlated with their political positions in terms of *Kyuchu-Sekiji* throughout the period under examination. For the economic elites, although centrality was not correlated with their economic positions in terms of the scale of firms in which they worked as directors in 1902, these two variables became correlated by 1927. This implies that only economic elites with higher economic positions could make kinship ties with other elites, particularly peerage political elites.

These findings suggest a broad picture of the evolution of elite communities during modernization. That is, although modern state-building and economic development provided opportunities for commoners to become new political and economic elites and shook traditional

elite communities, old peerage elites survived and expanded their kinship networks with new economic elites, which resulted in an extended elite community fusing old and new elite.

Notes

[1] Modernization refers to the transitional process of moving from traditional or primitive communities to modern societies (Shilliam 2010:1) and modernity's roots are usually traced to the French democratic and British industrial revolutions in the late 18th century (Nisbet 1967).

[2] Maddison Historical Statistics (https://www.rug.nl/ggdc/historicaldevelopment/maddison/?lang=en)

[3] This includes a position called *daijin taigū* of which the literal meaning is an equivalent position of minister.

[4] Regarding the imperial family, because there were no entries in the *Jinji Kōshinroku* directory, data was only added for the imperial households mentioned in the lists of relatives' names in the column of other elites. Additionally, members of the imperial family, dukes, and marquises automatically obtained seats in the House of Peers, so even when there was no explicit mention of them being members of the House of Peers in the record, they were added as such.

[5] This paper focuses on economic elites and political elites, defined in the main text, i.e. executives of large corporations and diet members, while disregarding the large landowners who did not have those attributes, but solely relied on agricultural incomes. What was the relationship between the political and economic elites and these pre-modern landowners with agricultural incomes? To add to the discussion on this point, we identified the top 100 large landowners who possessed extensive landholdings in 1902, 1914, and 1927. (See Online Appendix A.1 for the method of identifying large landowners.) The findings reveal that a vast majority of large landowners were also employed in some occupation in 1914 and 1927, rather than relying solely on agricultural income. This suggests that during the period of modernization, even the top large landowners were not merely reliant on agricultural income from pre-modern peasants but were also integrating into modern society.

The specifics are as follows: In 1902, there were 10 landowners classified as part of the political and/or economic elite, with only one non-political/economic elite landowner listed in the *Jinji Kōshinroku*; notably, 89 out of the top 100 large landowners were not listed. This observation may suggest a division between the emerging modern elite and large landowners reliant on peasant income. Conversely, in 1914 and 1927, 80 and 78 of the top 100 large landowners, respectively, were documented in the *Jinji Kōshinroku*. Among them, 22 were identified as economic and/or political elites in both 1914 and 1927. However, even among those who were not part of the political or economic elite, 38 out of 58 in 1914 and 38 out of 56 in 1927 were recorded as having other occupations in the *Jinji Kōshinroku*. In summary, only 20 out of 80 individuals in 1914 and 18 out of 78 individuals in 1927—roughly one-fourth of the large landowners—were solely landowners without any other listed occupation.

[6] In prewar Japan, it was legally allowed that a joint-stock company had its shareholders pay a part of the capital authorized by the shareholder meeting (Shimura 1969). This is the reason why the paid-in capital of a company could be smaller than its (authorized) capital. This part payment system of capital was not applied to partnerships (*gōmei gaisha*) and limited partnerships (*gōshi gaisha*).

[7] Additionally, when a non-elite, C, is identified as a relative of elites A and B, we investigated the relationship between A and B via C and recorded that relationship.

[8] It should be noted that economic elites who hailed from imperial families or the peerage and were not involved in political roles, were scarce. The statistics for this specific subgroup in our dataset were as follows: 7 individuals in 1902, 20 in 1914, and 18 in 1927. Moreover, considering

the historical observation that elites during the pre-period, the Edo period, were not engaged in commercial activities, we do not pursue any further subcategorization of economic elites.

[9] The version of R is 4.3.1 and the version of igraph is 1.5.0.1.

[10] See Figures A.1-A.3 in the online appendix for detailed subgraphs of neighborhoods of the top 3 elites in each year. These figures show that unlike those in 1902 and 1914, all three top elites had relatives who were economic elites and had an influence in the 1927 elite network.

[11] When political, civilian, and military bureaucratic elites advanced to higher positions, they were granted elevated honors commensurate with their new roles. Given that titles and awards were not revoked by the government, they generally represented the peak achievements for each family or individual elite. As a result, we excluded the ranks derived from (a) current and former posts and focused on the ranks derived from (b) titles and (c) awards.

[12] Awards were composed of (1) *Kunto* (Order of Merit), (2) *Ikai* (Court Rank), (3) *Kokyu* (Merit Grade) for military, and (4) *Jako-no-Mashiko* and *Kinkei-no-Mashiko* (honorary posts entitled to enter into the special rooms in the Japanese Emperor's Palace).

[13] For more details, see Matsumoto and Okazaki (2023).

[14] The distribution of the rank in *Kyuchu-Sekiji* and the logged value of the sum of the paid-in capital are reported in Figure A.4 in the online appendix.

[15] All the variance inflation factors (VIF) scores are below 3, indicating the absence of a multicollinearity issue.

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Tables

Table 1: Composition of top 100 firms by industry

	1902			1914			1927		
	Industry	Paid-in capital 1,000 yen	%	Industry	Paid-in capital 1,000 yen	%	Industry	Paid-in capital 1,000 yen	%
1	Railways	175,481	40.7	Bank	257,599	23.9	Electricity and gas	1,117,397	21.9
2	Bank	126,052	29.2	Railways	179,430	16.7	Holding companies	840,000	16.5
3	Marine shipping	30,750	7.1	Electricity and gas	173,455	16.1	Bank	721,451	14.2
4	Textile	27,539	6.4	Holding companies	98,000	9.1	Railways	558,672	11.0
5	Mining	22,800	5.3	Mining	78,750	7.3	Other manufacturing	531,541	10.4
6	Other manufacturing	22,744	5.3	Marine shipping	68,350	6.3	Mining	304,375	6.0
7	Holding companies	7,000	1.6	Food	60,445	5.6	Marine shipping	264,750	5.2
8	Electricity and gas	6,736	1.6	Textile	57,835	5.4	Commerce	216,000	4.2
9	Commerce	4,000	0.9	Other manufacturing	47,763	4.4	Textile	201,571	4.0
10	Food	3,490	0.8	Commerce	26,201	2.4	Food	179,305	3.5
11	Insurance	2,500	0.6	Exchange	15,000	1.4	Developing and real estate	70,000	1.4
12	Exchange	1,250	0.3	Developing and real estate	13,800	1.3	Exchange	63,000	1.2
13	Developing and real estate	1,000	0.2				Insurance	30,000	0.6
A. top 100 total		431,342	100.0		1,076,627	100.0		5,098,062	100.0
B. Japan total		1,245,295			2,719,308			14,530,266	
A/B (%)		34.6			39.6			35.1	

Table 2: Characteristics of elites

[a] Economic Elites

Year	1902	1914	1927
Minimum paid-in capital (JPY)	1000000	3000000	20000000
N of companies	114	106	102
N of economic elites (there are overlaps)	855	921	1210
Unique N of economic elites	651	713	984
N of economic elites listed in *Jinji Kōshinroku*	228	608	871

[b] Political Elites

Year	1902	1914	1927
N of ministers listed in *Jinji Kōshinroku* (including those designated by the government to be treated as ministers (*daijin taiguh*).)	15	12	14
N of members of House of Lords	365(in 1904)	380(in 1912)	403 (in 1926)
N of members of House of Lords listed in *Jinji Kōshinroku*	295	373	405
N of members of House of Representatives	367	381	464
N of members of House of Representatives listed in *Jinji Kōshinroku*	362	357	460
Total N of political elites listed in *Jinji Kōshinroku*	669	739	871

Notes: The information on the numbers of members of Houses of Lords and of Representatives were retrieved from Furuya (1975).

Table 3: Distribution of elite types in each network

Year	All elites	Economic elites (E)	Politicians from the imperial family or peerage (FP)	Commoner politicians (NFP)	E cum FP	E cum NFP
1902	849	180	207	414	7	41
1914	1286	547	239	439	11	50
1927	1675	804	205	599	16	51

Table 4: Matrix of elite types

[a] 1902

	(number of persons)	E	FP	NFP	E cum FP	E cum NFP
E	(180)	22	17	10	1	4
FP	(207)	-	222	10	28	1
NFP	(414)	-	-	3	0	0
E cum FP	(7)	-	-	-	3	0
E cum NFP	(41)	-	-	-	-	0

[b] 1914

	(number of persons)	E	FP	NFP	E cum FP	E cum NFP
E	(547)	193	176	49	26	26
FP	(239)	-	598	42	58	8
NFP	(439)	-	-	7	4	10
E cum FP	(11)	-	-	-	1	3
E cum NFP	(50)	-	-	-	-	1

[c] 1927

	(number of persons)	E	FP	NFP	E cum FP	E cum NFP
E	(804)	321	378	104	43	67
FP	(205)	-	761	92	142	17
NFP	(599)	-	-	47	12	13
E cum FP	(16)	-	-	-	4	4
E cum NFP	(51)	-	-	-	-	3

Table 5: Share of the isolated vertices

Year	All elites	E	FP	NFP	E cum FP	E cum NFP
1902	72.56%	71.67%	27.05%	94.93%	14.29%	90.24%
1914	62.21%	61.79%	20.09%	86.33%	14.26%	68.00%
1927	59.76%	60.45%	11.71%	77.80%	6.25%	47.06%

Table 6: Influence in the elite kinship network and political and economic positions.

Panel A. Politicians of the imperial family or peerage

outcome	PolRank					
sample	FP and E cum FP					
year	1902		1914		1927	
EigenScore	7.17**	(2.35)	6.26**	(2.25)	12.55***	(2.02)
E cum FP	3.05	(2.62)	-3.40	(2.22)	-3.52*	(1.63)
birthyear	-0.08*	(0.04)	-0.20***	(0.03)	-0.02	(0.03)
constant	192.34**	(65.54)	421.42***	(62.05)	87.07	(65.29)
N	203		238		212	
adj. R-sq	0.059		0.142		0.159	

Panel B. Commoner politicians

outcome	PolRank					
sample	NFP and E cum NFP					
year	1902		1914		1927	
EigenScore	304.86	(314.67)	57.87	(54.19)	32.82	(20.33)
E cum NFP	-4.35	(3.23)	-0.21	(1.94)	-1.12	(2.13)
birthyear	-0.57***	(0.10)	-0.63***	(0.07)	-0.70***	(0.06)
constant	1083.08***	(188.80)	1199.34***	(129.16)	1345.45***	(105.87)
N	121		258		362	
adj. R-sq	0.203		0.237		0.305	

Panel C. Economic elites

outcome	EconRank					
sample	E, E cum FP, and E cum NFP					
year	1902		1914		1927	
EigenScore	0.77	(1.22)	2.40*	(1.03)	1.97***	(0.39)
E cum FP	0.57	(0.60)	0.22	(0.31)	-0.19	(0.19)
E cum NFP	-0.09	(0.23)	0.21	(0.13)	0.20	(0.10)
birthyear	-0.02*	(0.01)	-0.01**	(0.00)	-0.01**	(0.00)
constant	56.81***	(16.38)	36.21***	(6.90)	33.94***	(5.11)
N	191		607		871	
adj. R-sq	0.036		0.028		0.039	

Notes: Columns display means and standard deviations (parentheses). * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Table 7: Influence in the elite kinship network and political and economic positions (detail).

Panel A. Politicians of the imperial family or peerage

outcome	PolRank					
sample	FP					
year	1902		1914		1927	
EigenScore among FP	9.80***	(2.71)	6.58**	(2.27)	11.08***	(2.27)
EigenScore across FP and NFP	7.11	(6.70)	4.69	(7.20)	-4.25	(6.54)
EigenScore across E and FP	-0.36	(6.73)	22.00**	(7.20)	6.47	(4.36)
birthyear	-0.08*	(0.04)	-0.18***	(0.03)	-0.01	(0.04)
constant	190.09**	(66.40)	383.84***	(63.43)	67.18	(68.58)
N	196		227		196	
adj. R-sq	0.059		0.164		0.121	

Panel B. Commoner politicians

outcome	PolRank					
sample	NFP					
year	1902		1914		1927	
EigenScore among NFP	0.00	(.)	8.73	(7.17)	8.55	(6.03)
EigenScore across FP and NFP	4.33	(10.28)	7.99	(10.06)	-1.73	(10.60)
EigenScore across E and NFP	3.65	(10.30)	-13.88	(10.13)	7.83	(10.27)
birthyear	-0.57***	(0.11)	-0.64***	(0.07)	-0.75***	(0.06)
constant	1090.09***	(201.44)	1219.42***	(135.33)	1430.28***	(111.55)
N	110		228		335	
adj. R-sq	0.190		0.246		0.327	

Panel C. Economic elites

outcome	EconRank					
sample	E					
year	1902		1914		1927	
EigenScore among E	0.69	(0.80)	1.16***	(0.34)	0.01	(0.29)
EigenScore across E and FP	-1.09	(1.30)	0.86	(0.89)	2.28***	(0.51)
EigenScore across E and NFP	0.94	(1.29)	0.80	(0.88)	-0.31	(0.68)
birthyear	-0.02*	(0.01)	-0.01**	(0.00)	-0.01*	(0.00)
constant	60.16**	(18.39)	36.62***	(7.03)	30.29***	(5.23)
N	144		546		804	
adj. R-sq	0.026		0.032		0.036	

Notes: Columns display means and standard deviations (parentheses). * Significant at the 5% level. ** Significant at the 1% level. *** Significant at the 0.1% level.

Figures

Figure 1: Economic development in Japan before WWII

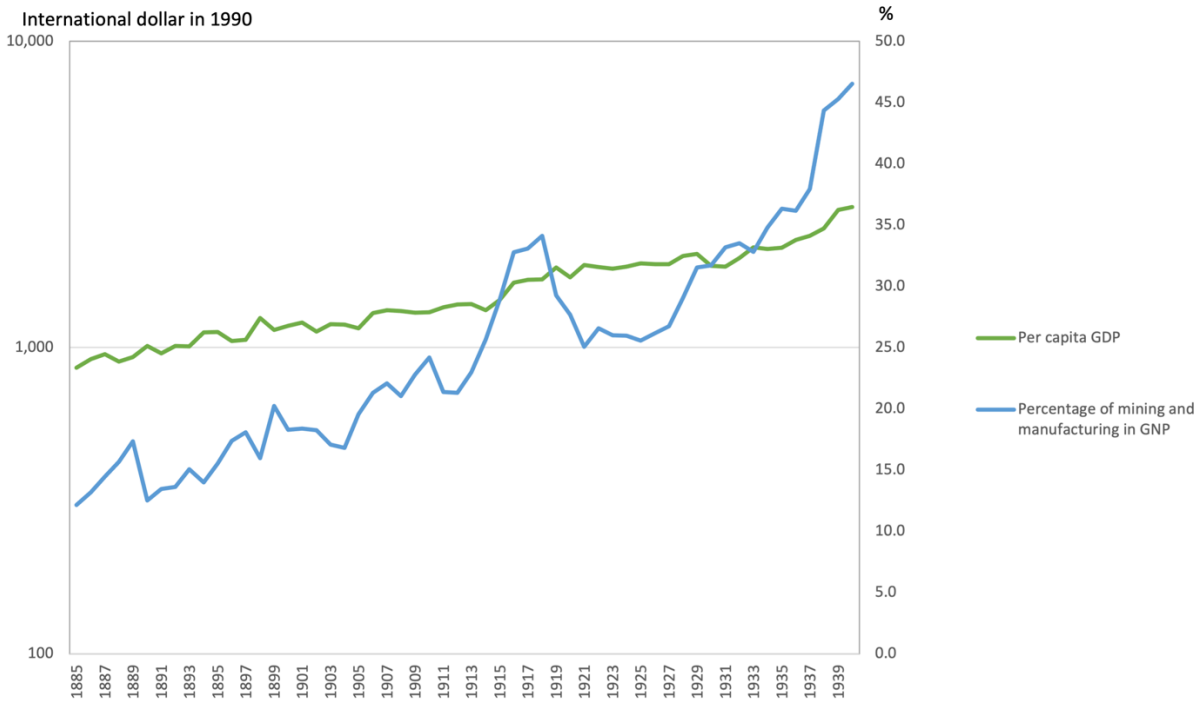
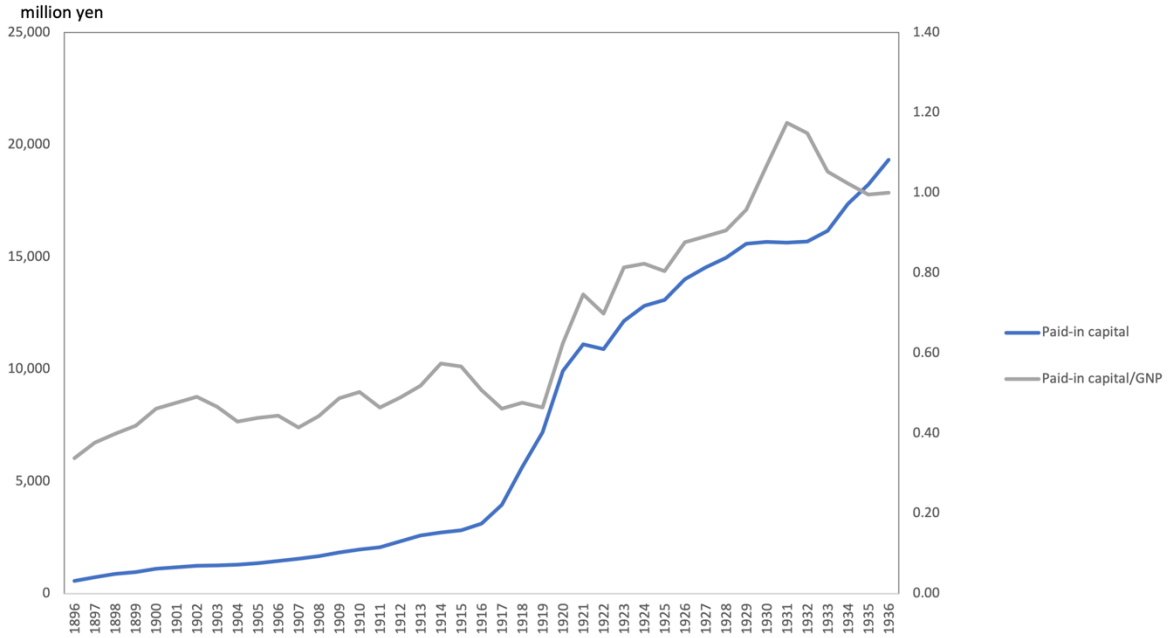


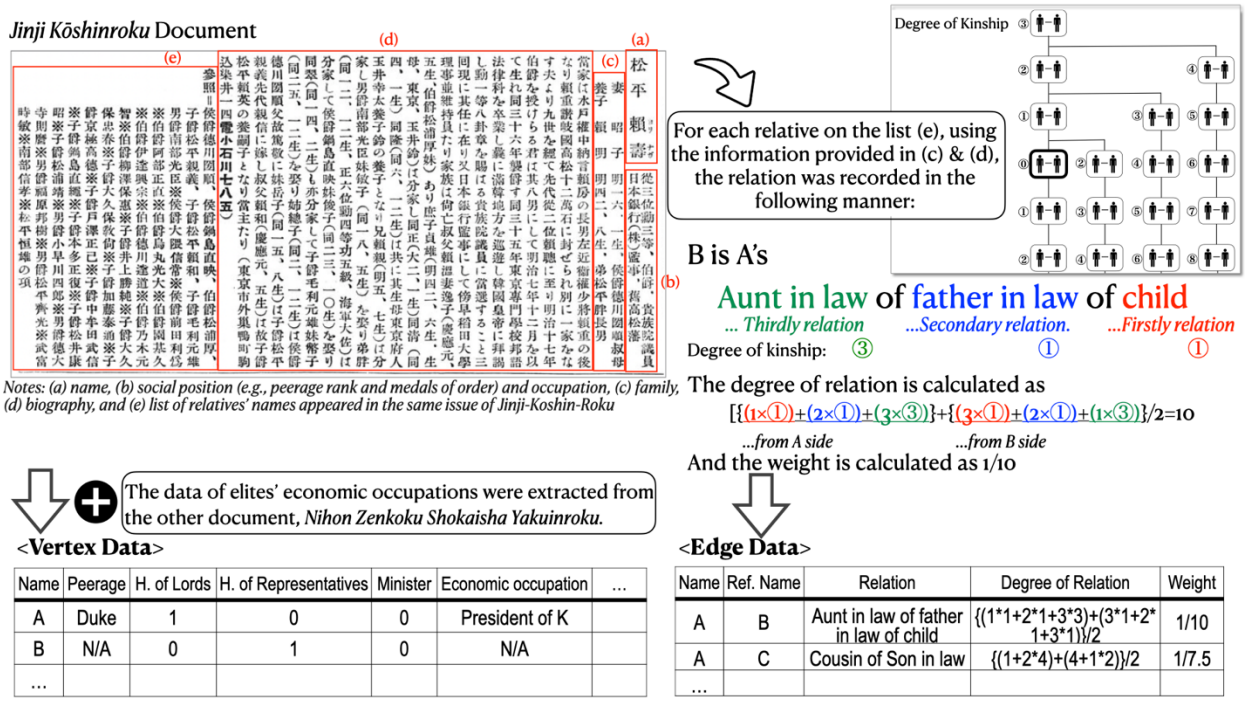
Figure 2: Growth of corporate capital



Source: Toyo Keizai Shinpo-sha (1927); Goto (1970); Statistics Bureau of Cabinet, *Dainihon Teteikoku Tokei Nenkan (Statistical Yearbook of the Great Japan Empire*, various issues.

Note: Paid-in capital includes that of banks (national banks, ordinary banks, saving banks, special banks and the Bank of Japan) and non-banking firms.

Figure 3: The procedure of constructing the elite network dataset.



<Vertex Data>

Name	Peerage	H. of Lords	H. of Representatives	Minister	Economic occupation	...
A	Duke	1	0	0	President of K	
B	N/A	0	1	0	N/A	
...						

<Edge Data>

Name	Ref. Name	Relation	Degree of Relation	Weight
A	B	Aunt in law of father in law of child	{(1*1+2*1+3*3)+(3*1+2*1+3*1)}/2	1/10
A	C	Cousin of Son in law	{(1+2*4)+(4+1*2)}/2	1/7.5
...				

Figure 4: The kinship relations between elites

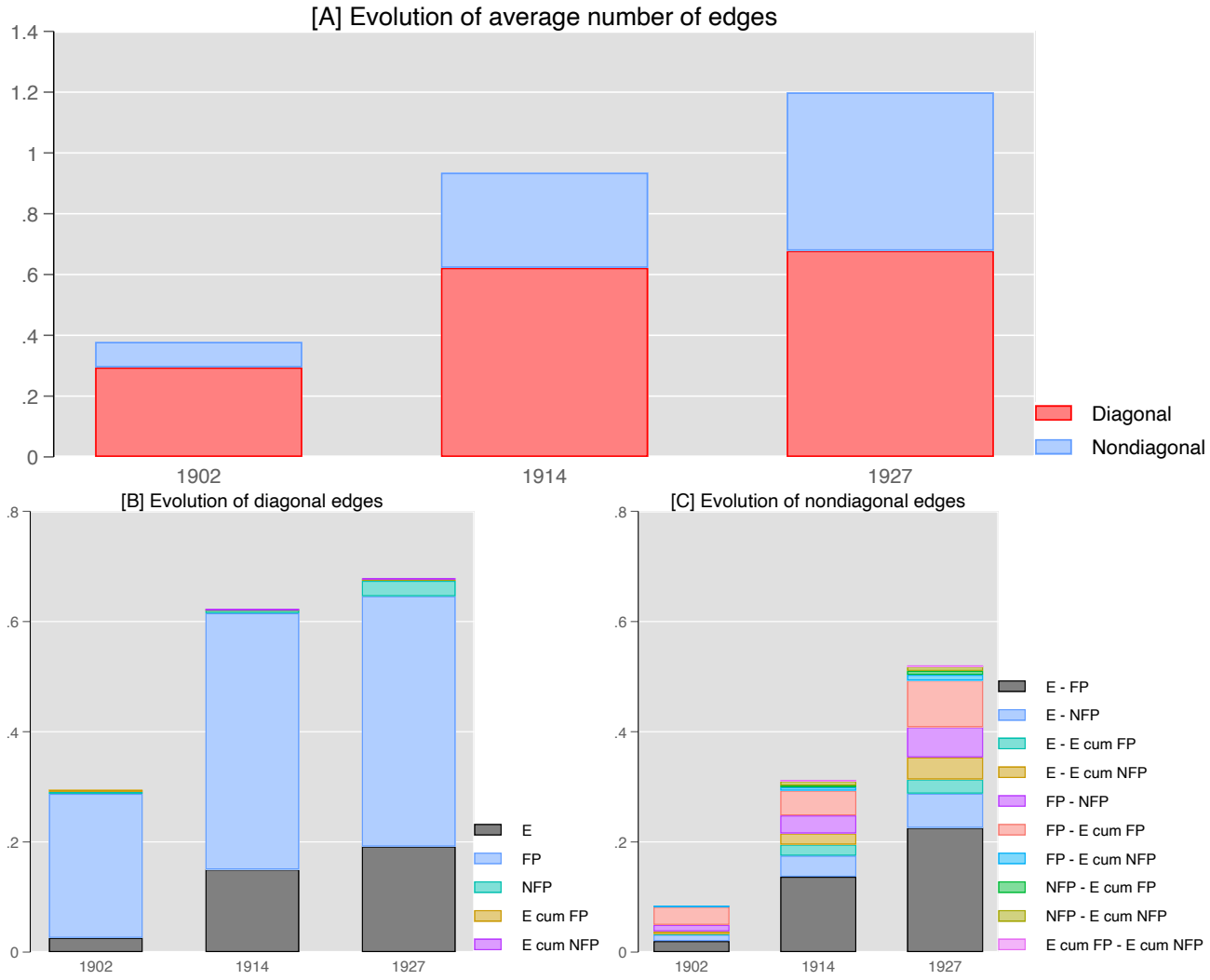
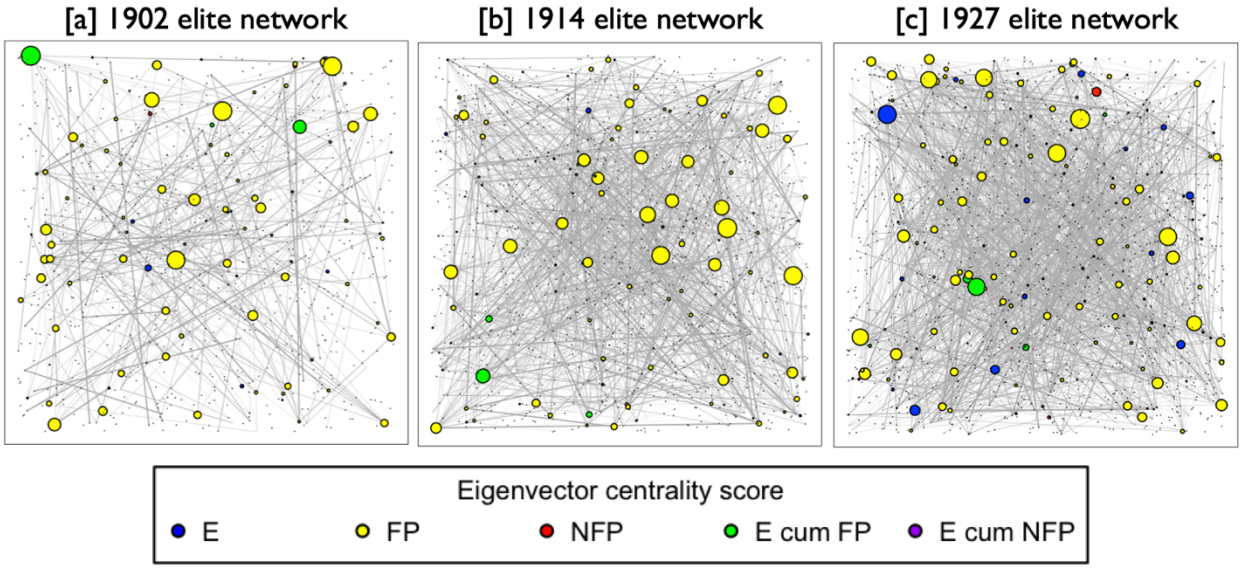
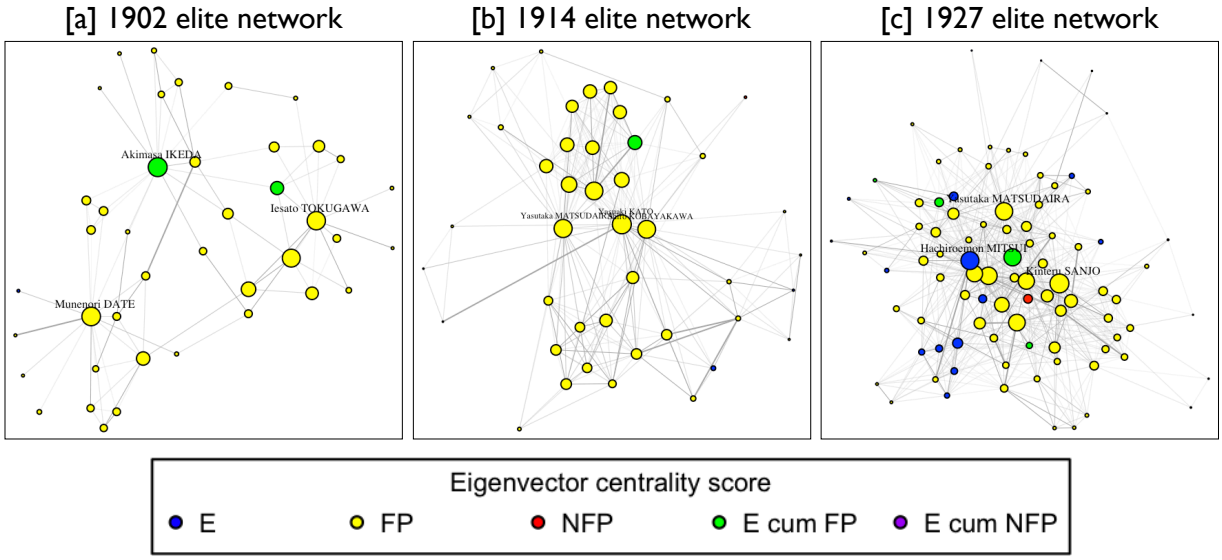


Figure 5: Elite kinship networks for each year: 1902, 1914, and 1927



Notes: The figure depicts the eigenvector centrality score as the size of a vertex and the closeness of each relationship between two elites as the width of the edge. The color of each vertex indicates whether she/he is an economic elite (E), a politician of the imperial family or peerage (FP), a commoner politician (NFP), or a combination of E cum FP or E cum NFP.

Figure 6: Subnetworks of neighborhoods of the top 3 elites in each year.



Note: Size of each vertex is the same as that shown in Figure 5. The top three elites with the highest eigenvector centrality scores were as follows: Akimasa Ikeda, Munenori Date, and Iesato Tokugawa in 1902; Yasuaki Kato, Yasutaka Matsudaira, and Shiro Kobayakawa in 1914; and Kinteru Sanjo, Hachiroemon Mitsui, Yasutaka Matsudaira in 1927.

Online Appendix for "The Marriage of Politics and Economy: Elite Fusion in the Age of Modernization" (not for publication)

A.1 Identifying the top large 100 landowners

The foremost scholar in landlord studies and data collection on landlords in Japan is Ryuichi Shibuya. Based on the data he collected, the identification of the top 100 large landowners was conducted as noted below:

Firstly, the data used to match with the 1902 Jinji Koshinroku was from Shibuya (1966), which introduced a list of large landowners in 1898. This list was originally published in the second edition of "*Nihon Zenkoku Shōkō Jinmei Roku* (Japan Nationwide Name Catalogue of Commercial Workers)*"* by Kihachi Suzuki and Itaro Seki in 1898. It included owners with property values of 10,000 Japanese yen or more as of September 1898. The top 100 in property values were selected, and they were presumed to be the top 100 large landowners during the same period and matched with the 1902 *Jinji Kōshinroku* data.

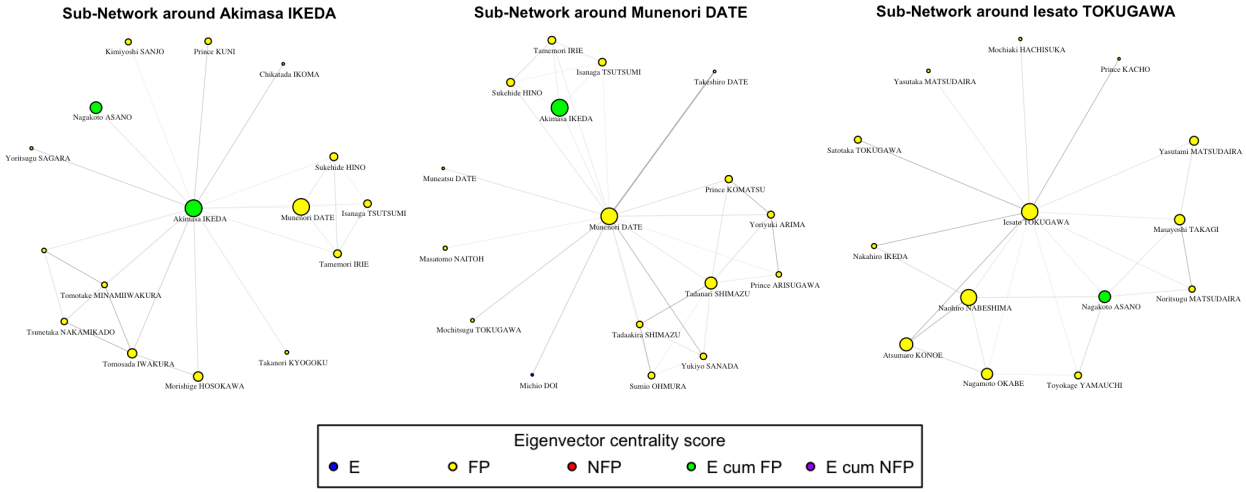
Although in reverse order, the data used to match with the 1927 *Jinji Kōshinroku* data is introduced next. Shibuya (1985) compiled the results of the 1924 survey by the Agricultural and Commercial Ministry's Agricultural Bureau on "*50 chōho ijō no daijinushi* (large landowners with fifty chōho or more)." This survey recorded the farmland area that each large landowner possessed in 1924. The land areas outside of Hokkaido were used as is, while Hokkaido's land area was converted to one-quarter, to identify the top 100 landowners. This conversion was done considering the different circumstances of land values between Hokkaido and other regions. This difference is observed: for example, after the World War II, during the agricultural land reforms, the maximum land ownership limit for resident landowners was 12 hectares in Hokkaido and 3 hectares in other regions.

Regarding the 1914 Jinji Koshinroku data, there were no data available for land values or land area for the corresponding years. Therefore, to identify the top 100 landowners during the same period, the following steps were taken: We found that data available for the same period were the asset amounts and occupations of the wealthy in 1916. This is the third survey of Jiji Shinpō and provided by the appendix of the October 7, 1916 issue of the Jiji Shinpō newspaper, which were recorded in Shibuya (1985). We consider landowners to be those who ranked among the above top 100 landowners in 1902 and/or 1927 and/or who had occupations listed as "agriculture" or "landowner" in the Jiji Shinpō's survey in 1916. Among these individuals, the top 100 in asset amounts were selected, and they were presumed to be the top 100 large landowners during the same period.

Reference
Ryuichi Shibuya 1966 "*Meiji chūki no jinushi meibo* (List of landowners in the mid-Meiji period)" *Tochi Seido Shigaku* 8(2): 54-70.
Ryuichi Shibuya 1985. *Taisho Showa Nihon Zenkoku Shisanka Jinushi Shiryō Shusei* (Collections on the Japanese wealthy persons during the Taisho and Showa period). volume 1. Tokyo: Kashiwa Shobo.

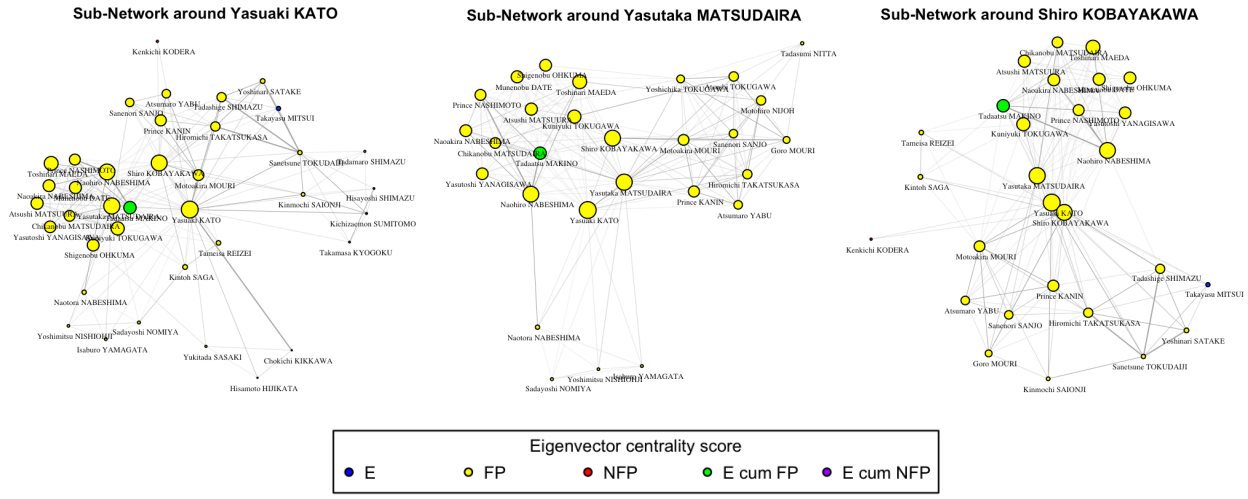
A.2 Omitted Figures

Figure A.1: Subnetworks of neighborhoods of the top 3 elites in 1902



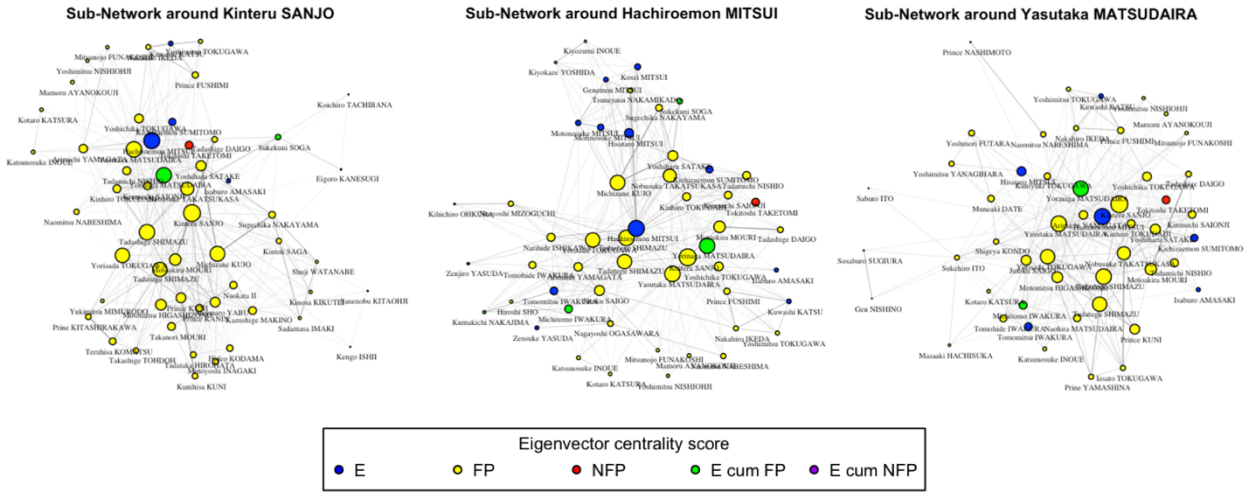
Note: Size of each vertex is the same as that shown in Figure 5. The subgraphs display the neighborhoods of the top three elites in 1902.

Figure A.2: Subnetworks of neighborhoods of the top 3 elites in 1914



Note: Size of each vertex is the same as that shown in Figure 5. The subgraphs display the neighborhoods of the top three elites in 1914.

Figure A.3: Subnetworks of neighborhoods of the top 3 elites in 1927



Note: Size of each vertex is the same as that shown in Figure 5. The subgraphs display the neighborhoods of the top three elites in 1927.

Figure A.4. Distribution of (a) $PolRank_i$ and (b) $EconRank_i$