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MEIJI JAPAN'S MASS PRIVATIZATION AND SUBSEQUENT GROWTH

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ABSTRACT

Rosenstein-Rodan (1943) and others posit that rapid development requires a 'big push' -- the coordinated rapid growth of diverse complementary industries, and suggests a role for government in providing such coordination. We argue that Japan's zaibatsu, or pyramidal business groups, provided this coordination after the Meiji government failed at the task. We propose that pyramidal business groups are private sector mechanisms for coordinating and financing 'big push' growth, and that unique historical circumstances aided their success in prewar Japan. Specifically, Japan uniquely marginalized its feudal elite; withdrew its hand with a propitious mass privatization that rallied the private sector; marginalized an otherwise entrenched first generation of wealthy industrialists; and remained open to foreign trade and capital.

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1 Introduction

Over sixty years ago, Rosenstein-Rodan proposed a state-coordinated *big push* to kick-start sustained growth.¹ After decades off economists' radar, the idea resurfaced in a 1989 model by Murphy, Shleifer, and Vishny.² Their intuition is cleaner: a car factory is scant use in a country without steel mills, oil refineries, gas stations, mechanics, roads, or people with disposable income. Economic development requires coordinated growth of demand and supply across multiple sectors, as firms in each exploit increasing returns to scale – often with firms in one sector bearing losses as another develops. Without coordination, growth falters because of a range of market failures. With coordination, increasing economies of scale in each growing industry spillover into growth opportunities in other sectors.³

A key problem is that first movers risk “hold-up” problems.⁴ “Hold up” occurs when one business's return depends on others' actions. For example, digging a coal mine next to a planned steel mill exposes the mine to a “hold-up” The steel company can demand cut price coal by threatening to walk away, leaving the mine without a nearby customer. Each wants the other to move first.⁵ Information asymmetries and adverse selection problems prevent the two parties from contracting their way out of the impasse. At worst, nothing happens; at best, one or both operate on inefficient scales.

Vertical integration solves this problem under some circumstances, for if a single company digs the mine and builds the steel mill, the problem evaporates.⁶ But the problem of coordinating rapid development across an entire economy is much knottier.⁷ Some goods are complementary, so a creamery does little business unless consumers have refrigerators. Other cross-industry dependencies take the form

¹ Paul Rosenstein-Rodan, “Problems of Industrialization of Eastern and South Eastern Europe,” *Economic Journal* 53 (1943).

² Kevin Murphy, Andrei Shleifer and Robert Vishny, “Industrialization and the Big Push,” *Journal of Political Economy* 97 (1989): 1003-1026.

³ For a history of the development of these concepts, see Renee Prendergast “Marshallian External Economies,” *Economic Journal* 103 (1993) 454-58.

⁴ See Oliver Williamson, “Markets and Hierarchies: Some Elementary Considerations,” *American Economic Review* (May 1973): 316-325 and Oliver Williamson, “Credible Commitments: Using Hostages to Support Exchange,” *American Economic Review* 73, no. 4 (1983): 519-40.

⁵ G. De Fraja, “After you sir. Hold-up, direct externalities, and sequential investment”, *Games and Economic Behavior* 26 (1999) 22—39.

⁶ Sanford Grossman and Oliver Hart, “The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration” *Journal of Political Economy* 94 (1986) 691-719.

⁷ Kevin Murphy, Andrei Shleifer and Robert Vishny, “Industrialization and the Big Push,” *Journal of Political Economy* 97 (1989): 1003-1026.

of network externalities – for example, having a phone does a business little good if its suppliers and customers lack phones.⁸ Financial, legal, and physical infrastructure development, all critical to an economy’s ability to support entrepreneurship, share many characteristics of network externalities.⁹ Individuals investment in human capital also has such characteristics.¹⁰ Yet other coordination problems turn on having enough consumer demand to achieve economies of scale in production.¹¹ Rosenstein-Rodan concludes that integrating all such interdependencies within a single entity is essentially a call for central planning, and calls for the state to coordinate and subsidize a massive cross-industry surge of capital investment – a *big push*.

Rostow defines *economic takeoff* as the transition from a low-income to a high income growth path; and sees *big push* coordination lifting countries out of a *poverty trap*.¹² Kofi Annan’s UN Millennium Project and Sachs’ *shock therapy* both echo Rosenstein-Rodan’s call for a big push to bring developing countries to Rostow’s *economic takeoff*.¹³

But despite past big push efforts a growing income gap separates rich from poor countries.¹⁴ Easterly despairs of *big push* plans because they provoke government failures.¹⁵ Bauer argues that development depends on individual freedom, and that burdensome government causes *poverty traps*.¹⁶ Hayek criticizes

⁸ See Shmuel S. Oren, Stephen A. Smith, and Robert B. Wilson, “Nonlinear Pricing in Markets with Interdependent Demand,” *Marketing Science* 1 (1982) 287-313.

⁹ William Bygrave and Maria Minniti, “Social dynamics of entrepreneurship,” *Entrepreneurship Theory and Practice* 24 (2000) 25-38.

¹⁰ Gary Becker, Kevin M. Murphy, and Robert Tamura, “Human Capital, Fertility, and Economic Growth” *Journal of Political Economy* 98 (1990) 512-37.

¹¹ Kevin M. Murphy, Andrei Shleifer, and Robert Vishny, “Income Distribution, Market Size And Industrialization,” *Quarterly Journal of Economics* 104 (1989) 537-65.

¹² W.W. Rostow, “The Takeoff into Self-Sustained Growth,” *Economic Journal* 66, no. 261 (1956): 25-48 envisions five basic stages of development - traditional society, take-off preconditions, take-off, drive to maturity, and mass consumption.

¹³ The UN Millennium Project is described in *Investing in Development: A Practical Plan to Achieve the Millennium Development Goals: Main Report* (New York: United Nations, 2005); for Sach’s views, see Jeffrey D. Sachs, *The End of Poverty: Economic Possibilities for Our Time* (New York: Penguin Press, 2005).

¹⁴ For evidence on divergence, see Easterly, William, *The Elusive Quest for Growth*.(Cambridge, MIT Press, 2001); Danny Quah, “Twin peaks: Growth and convergence in models of distribution dynamics,” *Economic Journal* 106, no. 437 (1996): 1045-56; Danny Quah, “Empirics for economic growth and convergence,” *European Economic Review* 40, no. 6 (1996a): 1353-60, Lant Pritchett, “Divergence, Big Time,” *Journal of Economic Perspectives* 11, no. 3 (1997): 3-17 and others. China and India currently sustain historically high growth rates. Because of their large populations, the number of people emerging from poverty is unprecedented, even though most low income countries seem mired in poverty traps. Nonetheless, both China and India remain low income countries, challenged by high rates of rural poverty and illiteracy. See Prakash Loungani, “Inequality,” *Finance & Development* 40, no. 3 (2003): 22.

¹⁵ William Easterly, “The Big Push Deja Vu: A Review of Jeffrey Sach’s The End of Poverty: Economic Possibilities for Our Time,” *Journal of Economic Literature* 44, no. 1 (2006): 1.

¹⁶ Peter Thomas Bauer, *Dissent on Development: Studies and Debates in Development Economics* (London: Weidenfeld &

Rosenstein-Rodan specifically, stressing that governments lack the detailed information needed to coordinate a *big push*.¹⁷ Kornai adds that state subsidies distort investments by softening budget constraints.¹⁸ Krueger argues that extensive government intervention magnifies returns to political rent seeking, deepening poverty traps.¹⁹ Baumol and Murphy et al. explain how high political rent-seeking returns divert entrepreneurs from the positive externality investments needed for a successful *big push*.²⁰ Easterly's growing gap highlights a deep inconsistency if the very state intervention needed to coordinate a big push undermines it.

The only successful big push Easterly concedes is Meiji Japan.²¹ We therefore investigate this success, and find it to be an informative anomaly. In the late 19th and early 20th centuries, Japan's Meiji government organized a *big push*, much like that advocated by the UN Millennium Project. In the late 19th century, the government capitalized and subsidized numerous state-owned enterprises (SOEs), but government failure problems soon triggered a fiscal crisis. To restore public finances, Japan conducted a mass privatization as the 19th century drew to a close. Wealthy families and entrepreneurs assembled former SOEs into *zaibatsu*, large diversified pyramidal groups of listed firms. Japan then entered its *high growth era* and Rostow estimates its economic takeoff as complete perhaps by 1900, 1914 at the latest.²²

Highly industrially diversified business groups, of which *zaibatsu* are typical examples, are ubiquitous in developing economies.²³ We propose they are mechanisms for private sector coordination of

Nicolson, 1972) and Peter Thomas Bauer, *Reality and Rhetoric: Studies in the Economics of Development* (London: Weidenfeld & Nicolson, 1984).

¹⁷ Friedrich Hayek, "The Use of Knowledge in Society," *American Economic Review* 35, no. 4 (1945): 519-30.

¹⁸ Janos Kornai, *The Economics of Shortage* (Amsterdam: North-Holland, 1980).

¹⁹ Anne Krueger, "The Political Economy of the Rent-Seeking Society" *American Economic Review* 64 (1974): 291-303.

²⁰ William Baumol, "Entrepreneurship: Productive, Unproductive, and Destructive," *Journal of Political Economy* 98 (1990): 893-921; Keven M. Murphy, Andrei Shleifer, and Robert Vishny, "The Allocation of Talent: Implications for Growth," *Quarterly Journal of Economics* (May 1991): 503-530; Kevin M. Murphy, Andrei Shleifer, and Robert Vishny, "Why is Rent-seeking Costly to Growth?" *American Economic Review* 82 (1993): 409-414.

²¹ Others, notably Jeffrey D. Sachs, *The End of Poverty: Economic Possibilities for Our Time* (New York: Penguin Press, 2005), see 'big push' growth as critical in the economic histories of other developed economies too. Yet others stress Japan's mid 20th century growth as state directed; however this is the reconstruction of an industrial economy destroyed by war, not a big push in the sense of Rosenstein-Rodan. Also, econometric evidence disputes positive role of state planning in postwar Japanese reconstruction; see e.g. Richard Beason and David E. Weinstein, "Growth, Economies of Scale, and Targeting in Japan (1955-1990)," *Review of Economics and Statistics* 78, no. 2 (1996): 286-295.

²² W.W. Rostow, "The Takeoff into Self-Sustained Growth," *Economic Journal* 66, no. 261 (1956): 25-48.

²³ Tarun Khanna and Yishay Yafeh. "Business Groups in Emerging Markets: Paragons or Parasites?" *Journal of Economic Literature* (2007 forthcoming) document the extensive industrial diversification of typical business groups at length; Tarun Khanna and J. Rivkin, "Estimating the Performance Effects of Business Groups in Emerging Markets," *Strategic Management*

a *big push* growth via “tunneling” – transferring wealth from one group firm to another.²⁴ With tunneling coordinating growth across industries and a controlling shareholder preventing hold ups, business groups provide an alternative to a state-orchestrated *big push*.²⁵ We concede that the generality of our arguments remains speculative, and call for further research on Japan and other countries.

The article is organized as follows. Section 2 briefly reviews relevant literature on business groups. Section 3 describes Japan’s Meiji “shock therapy” marginalizing traditional elites. Section 4 describes the state-initiated big push, fiscal crisis, and mass privatization. Section 5 describe *zaibatsu*-led *big push* and the subsequent marginalization of their controlling shareholders. Section 6 concludes.

2. Previous Work on Business Groups

We are not proposing an alternative hypothesis to other economic explanations of business groups. Rather, we seek to synthesize competing hypotheses into a single overarching explanation. Thus, rather than test our thesis against alternative hypotheses, we draw on previous results to show that apparently clashing explanations and evidence coalesce into our thesis, yet retain their individual validity.²⁶ Thus, much of what we say is not new.

Our thesis accords with Ohkawa and Rosovsky, who see *zaibatsu* as foreign technology importers.²⁷ Their evidence matches our thesis, for a big push coordinates new technology investment across complementary industries. Indeed, without specifically mentioning the big push literature, their wording resonates: “[t]he most famous zaibatsu [were] based on the rapid industrialization that had occurred in the

Journal 22, no. 1 (2001): 45-74.

²⁴ For detailed methodology, see M.P. Bertrand, P. Mehra and S. Mullainathan, “Ferretting out tunneling: an application to Indian business groups.” *Quarterly Journal of Economics* 117 (2002): 121-148. For a survey, see Randall Morck, Daniel Wolfenzon and Bernard Yeung, “Corporate Governance, Economic Entrenchment and Growth,” *Journal of Economics Literature* 43 (2005): 657-722 and others.

²⁵ Masahiko Aoki, *Information, Incentives, and Bargaining in the Japanese Economy* (Cambridge: Cambridge University Press, 1988), 223 documents such coordination, writing that *zaibatsu* implement “centralized coordination” as “[t]he general trading company acted as a sole trading agent for member firms and was in a position to manipulate the terms of transaction with outsiders. The holding company pooled the profits of the operating firms.” He adds that “post-World War groups of companies - those of zaibatsu origin or those clustered around the principal banks - do not operate under such centralized coordination.”

²⁶ For recent surveys, see Randall Morck, Daniel Wolfenzon and Bernard Yeung, “Corporate Governance, Economic Entrenchment and Growth,” *Journal of Economics Literature* 43 (2005): 657-722 and Tarun Khanna and Yishay Yafeh, “Business Groups in Emerging Markets: Paragons or Parasites?” *Journal of Economic Literature* (2007.forthcoming).

²⁷ Kazushi Ohkawa and Henry Rosovsky, *Japanese Economic Growth: Trend Acceleration in the Twentieth Century* (Stanford: Stanford University Press, 1973)

first two decades of this century. Although it is difficult to generalize, perhaps, one can say that in the nineteenth century commerce was the major activity of zaibatsu; around World War I it was industry with particular emphasis on coal mining, shipbuilding, engineering, and glass; and in the 1920's, it became sophisticated industries."²⁸ Detailed industry-by-industry analysis of this shifting emphasis, though beyond our present scope, might accord with a big push.

Khanna and Yafeh propose coinsurance as a major purpose of business groups.²⁹ Using Japanese data, they show zaibatsu firms sharing risks in 1932-1943, though not necessarily in earlier periods. Examining data for 1921-1927 and 1933-37, Miyajima detects no such risk sharing, instead suggesting *zaibatsu* controlling shareholders monitor group firms' capital investment.³⁰ Our argument accords with both, clarifying the nature of key risks (hold up problems) and why a single controlling shareholder monitors firms in diverse industries (big push coordination).

Khanna and Palepu and others argue that business groups substitute for corrupt capital, labor, and product markets.³¹ They find group firms outperforming freestanding firms in corrupt economies, explaining that group firms can safely deal with other firms in the same group while freestanding firms risk being cheated at every turn. The market failures we stress are similar. Central coordination facilitates a big push by sidestepping hold-up problems and coordinating growth across industries. Given an efficient legal system, contracts between independent firms might substitute for a common controlling shareholder under some circumstances.³² Certainly, a greater centralization of control is plausibly needed

²⁸ *Ibid.* pp. 219-21. See also W.W. Lockwood, *Economic Development of Japan* (Princeton: Princeton University Press, 1954), 227 and Shigeaki Yasuoka, *Japanese zaibatsu (Nihonno zaibatsu)* (Tokyo: Nikkei, 1976) who writes: "that diversified businesses arise from the very beginning of the industrialization of under-developed countries when such countries contact with advanced capitalism, because under-developed countries undertake modernization or industrialization of all industrial sectors." Note however, that pyramidal business groups are radically different from diversified single firms. Explaining the advantages of diversification does not explain the ubiquity of pyramidal business groups.

²⁹ Tarun Khanna and Yishay Yafeh, "Business Groups and Risk Sharing Around the World," *Journal of Business* 78, no. 1 (2005): 301-340.

³⁰ H. Miyajima, *Economic history of industrial policy and corporate governance: micro analysis of Japanese economic development* (in Japanese) (Tokyo: Yuhikaku, 2004).

³¹ Tarun Khanna and Krishna Palepu, "Emerging Market Business Groups, Foreign Investors, and Corporate Governance," in *Concentrated Corporate Ownership*, ed. Randall Morck (National Bureau of Economic Research Conference Volume, Chicago: University of Chicago Press, 2001), Tarun Khanna and J. Rivkin, "Estimating the Performance Effects of Business Groups in Emerging Markets," *Strategic Management Journal* 22, no. 1 (2001), Tarun Khanna and Raymond Fisman, "Facilitating Development: The Role of Business Groups," *World Development* 32, no. 4 (2004): 609-628.

³² On the importance of law to modern corporations, see La Porta, Rafael, Florencio Lopez-De-Silanes, Andrei Shleifer, Robert W. Vishny. "Legal determinants of external finance." *Journal of Finance* 52, no. 3 (1997a): 1131-1150.

to achieve a *big push* where corruption is rife.

Yafeh captures part of our thesis, arguing that vertically integrated *keiretsu* in postwar Japan, wherein a major firm like Toyota holds control blocks in listed supplier and customer firms, arose to limit hold-up problems.³³ We elevate Yafeh's insight into a broader theory of pyramidal business groups as major players in big push growth. Even closer to our argument, Khanna and Yafeh refer to *zaibatsu* helping the government coordinate a big push. But ours differs fundamentally, for we see *zaibatsu* taking command of a big push that was failing under state leadership.³⁴

Much work stresses tunneling, the controlling shareholder siphoning wealth from listed group firms to benefit himself, as a primary *raison d'être* for business groups.³⁵ Our thesis accords with this too. Coordinating a big push requires the massive tapping of national savings, so group firms need public shareholders. It also requires group firms in some industries to subsidize those in other industries, and to forsake hold-up opportunities. Their shareholders would understandably perceive this as tunneling and as poor governance. An undisputed controlling shareholder is needed to overrule them so the big push can proceed. Thus, evidence of tunneling between group firms accords with our thesis.

One objection to this reasoning is that extensive tunneling deters the public from buying group firms' shares. However, this misapprehends agency theory. Rational shareholders forecast tunneling losses and discount share prices accordingly. At low enough prices, they buy and earn equilibrium risk-adjusted returns. Expected tunneling reduces insiders' proceeds from floating a set fraction of a firm's shares, and its cost, like all expected agency costs, falls on the initial owners at the initial public offering (IPO).³⁶ Expected tunneling raises firms' costs of tapping public equity, but does not 'exploit' public shareholders.

But a large literature portrays a dark side to pyramidal groups. Berle and Means fear extreme

³³ Yishay Yafeh, "Japan's Corporate Groups: Some International and Historical Perspectives," in M. Blomström, J. Corbett, F. Hayashi and A. Kashyap (eds.) *Structural Impediments to Growth in Japan* (Chicago, University of Chicago Press, 2003).

³⁴ Tarun Khanna and Yishay Yafeh. "Business Groups in Emerging Markets: Paragons or Parasites?" *Journal of Economic Literature* (2007 forthcoming) argue that K. Ohkawa. and H. Rosovsky, *Japanese Economic Growth: Trend Acceleration in the Twentieth Century* (Stanford, Stanford University Press, 1973) advance this thesis..

³⁵ Surveyed in Randall Morck, Daniel Wolfenzon and Bernard Yeung, "Corporate Governance, Economic Entrenchment and Growth," *Journal of Economics Literature* 43 (2005): 657-722.

³⁶ Michael Jensen and William Meckling, "The Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics*. 3 (1976) 305-360.

governance abuses in pyramidal groups.³⁷ This may explain why the United States forcibly dismantled its business groups in the 1930s, the London Stock Exchange did likewise in the 1970s; and Korea seems intent on curbing its *chaebol*.³⁸ Haber argues that aging tycoons and the heirs to great business families often undermine sustained growth.³⁹ Once wealthy, they see a dynamic and consequently unstable economy as threatening a *status quo* they enjoy.⁴⁰ Others suggest untalented, but well-connected heirs to old-money pyramids find political rent-seeking their highest value investment.⁴¹ This could retard growth as effectively as government failures in a state-run big push.⁴²

This dark side to pyramidal groups seems initially to contradict our thesis. But the dark side characterizes business groups controlled by geriatric tycoons or inadequate heirs; not the highly talented controlling shareholders of the other discussions. Big pushes generally fail, and a natural progression from entrepreneurial controlling shareholders to entrenched heirs might convert growth-promoting

³⁷ Adolf Berle and Gardiner Means, *The Modern Corporation and Private Property*. (New York: Macmillan, 1932); Lucien Bebchuk, Reinier Kraakman, and George Triantis, "Stock Pyramids, Cross Ownership and Dual Class equity: The Mechanisms and Agency Costs of Separating Control from Cash Flow Rights," in *Concentrated Corporate Ownership*, ed. Randall Morck (National Bureau of Economic Research Conference Volume. Chicago: University of Chicago Press, 2000); Randall Morck, David A. Stangeland, and Bernard Yeung, "Inherited Wealth, Corporate Control, and Economic Growth: The Canadian Disease," in *Concentrated Corporate Ownership*, ed. Randall Morck (National Bureau of Economic Research Conference Volume. Chicago: University of Chicago Press, 2000).

³⁸ Re. the US, see Randall Morck, "How to Eliminate Pyramidal Business Groups: The Double-Taxation of Intercorporate Dividends and Other Incisive Uses of Tax Policy," in *Tax Policy and the Economy*, ed. James Poterba (Cambridge: MIT Press, 2005a); re. the UK see Julian Franks, Colin Mayer and Stefano Rossi, "Spending Less Time with the Family: The Decline of Family Ownership in the United Kingdom," in *A History of Corporate Governance around the World: Family Business Groups to Professional Managers*, ed. Randall Morck (Chicago: University of Chicago Press, 2005), and re. Korea see Phil-Sang Lee, "Economic Crisis and Chaebol Reform in Korea," discussion paper no. 14 (School of Business Administration, Korea University, 2000).

³⁹ Stephen Haber, *Political Institutions and Economic Growth in Latin America: Essays in Policy, History, and Political Economy* (Stanford: Hoover Institution Press, 2000); Stephen Haber, *Crony Capitalism and Economic Growth in Latin America: Theory and Evidence* (Stanford: Hoover Institution Press, 2002).

⁴⁰ Mancur Olson, Jr. "Rapid Growth as a Destabilizing Force," *Journal of Economic History* 23, no. 4 (1963): 529-552; Randall Morck, Daniel Wolfenzon and Bernard Yeung, "Corporate Governance, Economic Entrenchment and Growth," *Journal of Economics Literature* 43 (2005): 657-722.

⁴¹ Randall Morck, David A. Stangeland, and Bernard Yeung, "Inherited Wealth, Corporate Control, and Economic Growth: The Canadian Disease," in *Concentrated Corporate Ownership*, ed. Randall Morck (National Bureau of Economic Research Conference Volume. Chicago: University of Chicago Press, 2000); Randall Morck and Bernard Yeung, "Family Control and the Rent-Seeking Society," *Entrepreneurship Theory and Practice* 19 (2004): 391-409; Kathy Fogel, "Oligarchic family control, social economic outcomes, and the quality of government," *Journal of International Business Studies* 37 (2006): 603-622; Raghuram Rajan and Luigi Zingales, "The great reversals: the politics of financial development in the twentieth century," *Journal of Financial Economics* 69, no. 1 (2003): 5-50; Anne Krueger, "Why Crony Capitalism is Bad for Economic Growth," in *Crony Capitalism and Economic Growth in Latin America: Theory and Evidence*, ed. Stephen Haber (Hoover Institution Press, 2002); Randall Morck and Bernard Yeung, "Family Control and the Rent-Seeking Society," *Entrepreneurship Theory and Practice* 19 (2004); Randall Morck and Bernard Yeung, "Agency problems in large family business groups," *Entrepreneurship Theory and Practice* 27, no. 4 (2003).

⁴² Kevin M. Murphy, Andrei Shleifer, and Robert Vishny, "The Allocation of Talent: Implications for Growth," *Quarterly Journal of Economics* (May 1991): 503-530; Kevin Murphy, Andrei Shleifer, and Robert Vishny, "Why is Rent-seeking Costly to Growth?" *American Economic Review* 82, no. 2 (1993): 409-414; Anne Krueger, "The Political Economy of the Rent-Seeking Society." *American Economic Review* 64 (1974): 291-303.

pyramids into growth-blocking artifacts.

If so, we must explain Japan's oddly successful big push. To do this, we show this progression failing in Japan because of uniquely sweeping early shock therapy marginalizing the feudal elite, a fiscal crisis draining bureaucratic power, and military governments (Japanese and American) marginalizing zaibatsu families. We also argue that Meiji Japan's so-called "unequal treaties", even when renegotiated, limited trade and investment barriers. Openness checks elites' power, and thus the downsides of pyramidal groups.⁴³ The unequal treaties gave foreign courts jurisdiction in concession enclaves, providing Japanese unobstructed views of foreign jurisprudence, likely helping Japan implement an effective legal system – which further limits these downsides.⁴⁴ Openness also lets imports and exports, as well as foreign capital, compensate for missing or misscaled parts of the domestic economy as a big push builds.⁴⁵ Japan's propitious timing and persistent openness may thus highlight conditions for successful big pushes that might be deliberately imposed elsewhere.

Finally, we reiterate that we in no way challenge the validity of other explanations of business groups. Rather, we seek to reconcile them as consistent with business groups orchestrating big push growth. We further acknowledge that our big push thesis need not fully subsume the above hypotheses, which may well retain independent validity entirely independent of big push growth.

3. Shock Therapy

Before its big push, Japan underwent sweeping institutional renewal that uniquely marginalized traditional elites. Unique in depth and scope, this 'shock therapy' may well explain Japan's ultimately

⁴³ Raghuram Rajan and Luigi Zingales, "The great reversals: the politics of financial development in the twentieth century," *Journal of Financial Economics* 69, no. 1 (2003): 5-50 show Japan relatively open in 1913 – see esp. Table 3. For more general discussion of these points, see Raghuram Rajan and Luigi Zingales. *Saving Capitalism from the Capitalists* (Princeton, Princeton University Press, 2003).

⁴⁴ Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer, Robert W Vishny, "Trust in large organizations," *American Economic Review* 87, no. 2 (1997), 333-338.

⁴⁵ See e.g. Vitor Trindade, "The big push, industrialization and international trade: The role of exports" *Journal of Development Economics* 78 (2005) 22– 48. *

successful ‘big push’ and the failures of analogous efforts elsewhere.⁴⁶

3.1 The Shocking Truth

Prior to the arrival of Admiral Perry’s warships in 1854, Japan was remarkably isolated, with foreigners subject to instant death outside a tiny enclave in Nagasaki. The Tokugawa Shoguns, who ruled Japan from 1603 to 1868, preserved a rigidly stratified society. The elite were *samurai* – an hereditary caste of warriors with the power of life and death over their inferiors. The lesser castes were peasants, tradesmen below them, and merchants lowest of all. An intricate code of warrior ethics, *bushido*, forbade class mobility and enshrined samurai rule. That foreigners sought the company of merchants was an affront.

The shogunate, nonetheless, needed merchants – for samurai need weapons and taxpayers. Two great families, the Mitsui and Sumitomo, arose to such prominence as merchants might attain.

The Mitsui traded silk. Since money was not in general use, they ran a sophisticated barter operation – a general trading business. This operation, spanning Japan, was recruited by the Shogunate for tax farming, further enriching the Mitsui. The Sumitomo owned mines and supplied metal for weapons. Both silk finery and metals also bought curiosities and weapons from the barbarians confined in Nagasaki. Other Tokugawa merchant families were important in Japan, but only the Mitsui and Sumitomo survive Japan’s transition to play important roles in its big push.

Both families managed without money and modern economic institutions, like corporation or contract law. Consequently, both families developed *house rules* – constitutions dictating how business should be done; profits calculated, allocated, and disbursed; and power passed from generation to generation. House rules assigned key decisions to *family councils* – parliaments representing clans according to precise voting formulae. Thus, in an environment without ambient business law, merchant houses formulated their own laws and, as far as we can tell, adhered to them rigidly. Private legal systems served both merchant houses well, making their behavior predictable and their promises credible. The Mitsui and

⁴⁶ See William Easterly, “The Big Push Deja Vu: A Review of Jeffrey Sach’s *The End of Poverty: Economic Possibilities for Our Time*,” *Journal of Economic Literature* 44, no. 1 (2006): 1, and cites therein.

Sumitomo became preferred business partners for economic actors of all kinds, including the Shogunate.

In 1853, the United States dispatched about one-fourth of its navy to Japan.⁴⁷ Their humanitarian goal, lifting the death penalty on foreigners shipwrecked off Japan, veiled a commercial mission – opening Japan to American traders. The commander, Admiral Matthew Perry, sailed into Tokyo Bay in violation of Japanese law, presented Tokugawa officials a draft trade treaty, and continued on to China. The following year he returned with a larger fleet and, under American cannon, the Shogunate signed the *Convention of Kanagawa*, which protected shipwrecked sailors, let U.S. ships buy coal, and opened Shimoda and Hakodate to American traders.

Japan's accession to the Victorian global economy was formalized with the 1858 *Treaty of Amity and Commerce*. This U.S.-imposed treaty opened Tokyo, Kobe, Nagasaki, Niigata, and Yokohama to American trade, fixed low tariffs, and gave consular courts extraterritorial jurisdiction over “concession” areas in those ports. Similar treaties with the Britain and other Western powers soon followed.

Japan was thus suddenly flung open to free trade and foreign investment in the concessions. These agreements were denigrated in Japan as *unequal treaties* because they enforced no similar concessions for Japanese in foreign countries, and were renegotiated in 1899. Tariffs rose very slightly, but foreign companies could now operate throughout Japan. General Electric, Western Electric, Vickers Armstrong, and other major firms starred in a large-scale foreign direct investment inflow that continued until 1930.⁴⁸

Japan remained open to foreign trade and investment openness until the Great Depression.⁴⁹ Japan's Tokugawa rulers realized that globalization required domestic reforms, and from 1899 on, taxed industry more lightly than agriculture.⁵⁰ But comprehensive liberalization proved beyond their abilities.

⁴⁷ Edwin D. Reischauer, *The Japanese Today: Change and Continuity* (Cambridge, Harvard University Press, 1988) p. 78.

⁴⁸ Hideaki Miyajima, *Economic history of industrial policy and corporate governance: micro analysis of Japanese economic development* (in Japanese) (Tokyo: Yuhikaku, 2004); Takahusa Nakamura, *Japanese Economy in Meiji and Taisho Era* (Meiji Taishokino keizai) (in Japanese) (Tokyo: University of Tokyo Press, 1985): 26, 54.

⁴⁹ Although trade grew robustly, domestic capital investment and applying foreign technology appear more important to Japan's growth. Carl Mosk, “Japan, Industrialization and Economic Growth,” in *EH.Net Encyclopedia*, ed. Robert Whaples, 2004. eh.net/encyclopedia/article/mosk.japan.final (Jan. 19, 2004). Ryoshin Minami, *Economic Development of Japan: A Quantitative Study*. [2nd ed. (Houndmills Basingstoke, UK: Macmillan, 1994). Kazushi Ohkawa and Henry Rosovsky. *Japanese Economic Growth: Trend Acceleration in the Twentieth Century* (Stanford, CA: Stanford University Press, 1973).

⁵⁰ In 1899, Japan enacted a flat 2.5% corporate income tax, though the rate rose to 6.25% for the 1904–5 Russo-Japanese War. A permanent inheritance tax was enacted in 1905. Horiguchi, Kazuya, Outline of the 1898 Income Tax Legislation (Meiji 32nen no shotokuzeiho kaisei no rippoteki enkaku) (in Japanese), Zeimu Daigakko paper, 1997; Zeimu Daigakko, Tax law

3.2 Shock Therapy

This backdrop perhaps explains the subsequent political *tsunami*. In 1868, a band of young samurai overthrew the craven Tokugawa shoguns. With the *Meiji* emperor, previously relegated to ceremonial duties, as their figurehead; these zealous warriors launched the *Meiji Restoration*.⁵¹ Their *coup* triggered perhaps the deepest transformation ever effected on a major economy.

The regime dispatched young Japanese abroad to study science, law, economics, engineering, and every other field relevant to modernization – and then report home. The knowledge these emissaries brought back frightened the *Meiji* rulers, who resolved to restore Japan its rightful place in the world. The modernization they implemented was unparalleled until the post-socialist reconstructions of the 1990s in Eastern Europe. The term *shock therapy*, coined in that context by Sachs seems appropriate here as well.⁵²

Meiji shock therapy, like its late 20th century analogs, launched comprehensive reforms across all aspects of the economy nearly simultaneously. Within a few years, Japan adopted parliamentary democracy modeled on the German Diet, compulsory public education modeled on French and German schools, universities and a modern military fashioned after those of Prussia, and a fleet modeled on the Royal Navy. Religious freedom, social mobility, and land reform became official policy.

Most pertinently, the reformers imposed 19th century liberal capitalism. Finding hereditary casts and warrior ethics hopelessly fusty; they abolished all feudal ranks and privileges in 1871.⁵³ The feudal

references (Zeimu shiryō library) in Japanese, Zaimu Daigakko, Japanese Tax Agency, Tokyo, 2007, at www.ntc.nta.go.jp/sozei/siryō/index.html.

⁵¹ The Meiji Restoration was a sequence of radical political, economic, military and cultural transformations. Beginning in the late Tokugawa era, the Restoration is generally considered complete by 1877 when, a conscript army suppressed the Seinan Uprising, the last in a series of rebellions by feudal warlords and other traditionalists. See also Samuels, Richard. *Rich nation, strong army – national security and the technological transformation of Japan*. New York: Cornell University Press, 1994.

⁵² Shock therapy holds that institutional reform must be comprehensive, not piecemeal. Lipton and Sachs argue that Poland cannot establish a market economy without simultaneously establishing supporting institutions: law, courts, regulators, institutional investors, social insurance, and the like. Each, in turn, requires other supporting institutions. Shock therapy advocates the total replacement of one set of institutions by another. Japan's Meiji leaders drew similar conclusions for similar reasons. Hence, the term, though not used then, aptly their policies. David Lipton and Jeffrey Sachs, "Creating a Market Economy in Eastern Europe: The Case of Poland," *Brookings Papers on Economic Activity* 1 (1990): 75-147.

⁵³ Edwin O. Reischauer, *The Japanese Today: Change and Continuity* (Cambridge: Harvard University Press, Belknap Press, 1988): 81-83) explains "With the disappearance of the domains, the samurai lost their position as a hereditary bureaucratic class, and in 1873 universal military conscription was substituted for the old class basis for military service. In 1876 the samurai were even prohibited from wearing their swords, their badge of distinction. Samurai stipends were also drastically reduced and by

system bound society together, so new glue was needed. Modifying the German Civil Code in stages, and with grafts from other legal models, Japan rapidly built a state-of-the-art late 19th century legal system. Regulations permitting public bond trading arrived in the early 1870s, and an 1878 Stock Exchange Ordinance opened the way for equity markets in Tokyo and Osaka. By 1888, Japan's Civil Code was fully as sophisticated as its German prototype.

3.3. Aftershock

Under the new code, merchant houses were suddenly *general partnerships* subject to previously unknown constellations of laws that overrode *house rules* and *family councils*. Adaptation proved beyond the capabilities of some merchant houses, and severely strained others. Mitsui and Sumitomo survived, but navigating the aftershocks was simple for neither. Both modernized by adopting Western technology – textiles manufacture and mining technologies, respectively – and by supplementing general trading with banking as money gained acceptance.

But institutional change proved harder than technological change. The legal system created previously unheard of liabilities, so many merchant families incorporated to obtain limited liability. But this created more problems, for they now found squabbling relatives claiming rights that never obtained under the ancient house rules. Even worse, rewards traditionally bestowed on successful hired managers turned out to be shares with voting rights. In short, new institutions undermined traditional norms, creating uncertainty around previously clear business dealings.

Hired managers holding shares proved unbearable, and many old families went to great lengths to rectify the situation. Mitsui Bank, founded in 1876, found itself with over 400 manager-shareholders and reorganized in 1893 to buy them all out. Other merchant families also bared their coffers buying back shares from hired managers. These buyouts alienated outsiders by underscoring their inferior status.

1876 were entirely commuted into relatively small lump-sum payments of cash or government bonds. Thus the samurai in a brief nine-year period were deprived of all their privileges, and Japan was started on a great change that was to transform its society in a mere generation or two from one in which status was determined primarily by heredity to one in which it depended largely upon the education and achievements of the individual.”

Loyal hired managers holding shares were intolerable, but outside shareholders were unadulterated outrage. A few merchant families, notably the Shimomura and Ohmura, financed growth with public equity and lost control to outsiders. Others therefore remained unlisted and dependent on internal funds. This curtailed their growth, and explains the eclipse of many Tokugawa merchant dynasties.

Into this void stepped a new generation of entrepreneurs without Tokugawa roots. Yataro Iwasaki (1834-1885) organized Mitsubishi around a state-subsidized shipping monopoly. Mitsubishi probably had a genuine business advantage, for Iwasaki instituted modern accounting before his rivals.⁵⁴ But its main advantage was government favors. The government wanted Japan to be a maritime power, and Iwasaki stepped forward to help. From 1875 on, his *Yubin Kisen Mitsubishi Kaisha* shipping company received ¥250,000 annually for carrying government mail. This subsidy protected Mitsubishi from foreign competition. Quickly acquiring 37 seafaring ships, Mitsubishi soon carried most of Japan's foreign trade. More subsidies flowed through the state-owned Nagasaki Shipyard, which lost money repairing and maintaining Mitsubishi ships – probably at cut rates. Iwasaki plowed his rapidly rising earnings into capital investment, and Mitsubishi grew rapidly to rival Mitsui and Sumitomo.

4. The State's Big Push

Japan's shock therapy aimed to build modern munitions plants, shipyards, and the like. Although Mitsui and Sumitomo embraced new technology for spinning silk or refining copper, and supplemented their trading operations with banking; they remained cool towards utterly new industries. This perhaps reflected a realistic assessment of their expertise; but building new business plainly required outside capital and neither family dared risk joining the Shimomura and Ohmura in economic oblivion. And

⁵⁴ The government required a double entry bookkeeping account for its annual subsidies, which were of unprecedented size. Yukichi Fukuzawa (1835 – 1901), the Meiji statesman, educator, author, philosopher and political theorist who founded Keio Gijuko, later Keio University, introduced Western accounting to public finances (Yukichi Fukuzawa. *Chu'ai no hou (Methods of bookkeeping)* (in Japanese) (Tokyo: Keio University Press, 1873); Shinichiro Shimme, "Introduction of double-entry book keeping into Japan," *Accounting Review*, 12 (1937)) and to his students. Although the Mitsui and Sumitomo also hired Keio graduates, Iwasaki, appreciated modern accounting and enthusiastically implemented it throughout his business operations. His son Hisaya, his manager Heigoro Masuda (1847-1922), and many other Mitsuibishi executives were Fukuzawa students. See e.g. Mitsubishi Public Affairs Committee (2006).

though Mitsubishi grew rapidly, it too lacked expertise outside shipping and related businesses.

Government prodding of merchant families to pool capital met determined resistance. The state exhorted many families into jointly capitalizing banks in the 1870s, but interfamilial squabbling paralyzed governance and each family soon established its own bank. The Mitsui thus abandoned the First National Bank, co-founded with the Ono and other families, to establish Mitsui Bank in 1876. More prodding to pool their capital and develop new industries seemed a poor plan.

4.1 State-Owned Enterprises

Instead, SOEs would build new industries essential to modernization. More SOEs would be needed to provide inputs to the first set, and still more to build railroads and other infrastructure. The new strategy quickly developed into a *big push* as SOEs materialized in one modern industry after another.⁵⁵

This effort was massive. From 1868 to 1885, the Industry, Interior, and Agriculture Ministries “special subsidy funds” of ¥52.9, ¥4.6, and ¥9.6 million total ¥69.3 million for SOE operating deficits, frontier development initiatives, and targeted loans. Adding the ministries’ operating costs – ¥15.4, ¥3.1, and ¥18.1 million, respectively – totals ¥42.4 million, bringing the grand total to ¥111.7 million per year. Separate accounts for new SOEs, an investment capital trust fund, and other programs total ¥16.1 million. Finally, prefecture industrial promotion grants total ¥1.6 million. All told, subsidies and their administration cost ¥127.83 million from 1868 to 1885. Given Japan's national income – ¥397 million in 1878, the first year of data – these sums are huge for the era.⁵⁶

⁵⁵ The Ministries of Industry (*kobusho*) and the interior (*naimusho*) emerged from a spate of administrative restructuring in the early Meiji era in 1871 and 1873, respectively.

⁵⁶ The figures here are from Ishizuka (p. 131), Kobunkan (c. 4), and Umemura and Nakamura (p. 29). Kobayashi, using slightly different years, concurs as to general magnitudes. On National Income, see Kazushi Ohkawa, “Production Structure,” in *Patterns of Japanese Economic Development: A Quantitative Appraisal*, eds. Kazushi Ohkawa and Miyohei Shinohara with Larry Meissner (New Haven: Yale University Press, 1979), 34-58, Ishizuka, Hiromichi, *Study of the Development of Japan's Capitalism (Nihon shihonshugi seiritsushi kenkyu)* (in Japanese) (Tokyo: Yoshikawa Kobunkan, 1973); M. Kobayashi, *Japan's industrialization and privatization of government enterprises (Nihon no kogyoka to kangyo haraisage)* (in Japanese), (Tokyo: Toyo Keizai, 1977); Ohkawa's estimates given in Japan Statistics Research Institute, *Japan economic statistics data (Nihon keizai tokei shu)* (in Japanese) (Tokyo: Japan Statistics Research Institute, 1958); Umemura, Mataji, and Nakamura, Takahusa (eds), *Matsukata Finance and Industrial Development Policies (Matsukara zaisei to shokusan kogyo seisaku)*, (in Japanese) (Tokyo: United Nations University and University of Tokyo Press, 1983).

The Industry Ministry oversaw mining, railways, civil engineering, telegraphy, navigation, shipbuilding, iron production, and manufacturing; and all SOEs therein. The greater parts of its investment flowed into state-owned railways and mines – 47.9% and 31.5%, respectively. Lesser amounts financed SOEs in telegraphy (12.3%) and manufacturing (8.3%).

The ministry expected its gold and silver mines to generate revenue. It operated ten large mines directly, and leased the management of others to private contractors. But Japan's only modern colliery, the Takashima mine near Nagasaki, was Dutch-owned, albeit with Japanese partners.⁵⁷ This embarrassed the government, and the state bought the Takashima mine for \$400,000 in 1874. Many thought this ridiculously generous and accused the government variously of bribing foreigners or bargaining ineptly.

Japan needed railroads to transport goods, but also to build Japan's regions into a nation. The ministry thus emphasized linking interior regions to ports. The same nation-building agenda charged the ministry with modernizing Hokkaido, spotting the undeveloped territory with cotton and sugar mills, breweries, creameries, canneries, and other SOEs.

The Interior Ministry oversaw commerce, vital statistics, the post, cartography, surveys, and policing. It had budgets for civil engineering projects and SOEs. Its SOE subsidies went 29.0% to agricultural products, 28.6% to dairy products, 28.2% to cotton textiles, 8.6% to silk, and 2.0% to experimental farms; with lesser amounts to forestry, crafts and commerce, and maritime shipping.

Its control over policing and other regional matters brought direct involvement in local economies. Thus, the ministry financed experimental farms, farm factories, and dairy farms – all on small local scales. Its model silk, cotton and other textile, and paper mills, unlike the Industry Ministry's gargantuan SOEs, were not designed to force industrialization; but to introduce new technologies that would eventually substitute domestic goods for imports. Its policies thus foreshadowed twentieth century

⁵⁷ The Dutch merchant, T.B. Glover, held a controlling interest.

“import substitution” theories.⁵⁸

The government also inherited state-owned mines and enterprises the Tokugawa established in their final years. Many went to the military – the navy took Yokosuka ironworks, Yokohama ironworks, Uraga shipbuilding, and Ishikawajima shipbuilding; and the army Sekiguchi manufacturing. The Sado gold mine and Ikuno silver mine fell to the Industry Ministry. Industrial ventures by individual warlords, typically with direct military objectives, were also seized when the feudal order was abolished in 1871. Of these, the Shikine gun powder plant and Shuseikan manufacturing complex went to the navy; the Takinokami gun powder plant and Ogi Chuzou metal casting plant went to the army, a raft of mines and Hyogo shipbuilding went to the Ministry of Industry, and the Sakai textiles plant went to the Ministry of Finance.

However, the most important SOEs were established by the state anew. These include large ventures in chemicals, machinery, mining, printing, railways, shipbuilding, telegraphy, and textiles. In mining, the Aburato venture was notable. In machinery and chemicals, the government established Akabane Seisakusho, Cement Seizosho, Shingawa Glass Seizosho, and Shirorengaishi Seizousho. In textiles, key state-established ventures include Tomioka Seishisho, Shinmachi Bousekisho, Senju Seijusho, Aichi Bosekisho, and Hiroshima Bosekisho. Although they also established new gold and silver mines, the reformers’ hopes that mining revenues could fund modernization were unfulfilled.

Various branches of government apparently disputed control. Telegraphy and lighthouses ultimately fell to the Communications Ministry. Railways ultimately ended up directly run by the Cabinet. The Navy and Army controlled munitions and related enterprises. For example, the Navy ran Yokosuka Iron and Steel, Yokohama Iron and Steel, Uraga Shipbuilding, and Ishikawajima Shipbuilding.⁵⁹

4.2 Government Failure

To finance its big push, the government seized control of all taxation, abolishing the feudal rice tax and

⁵⁸ See e.g. Kobayashi on the Interior Ministry, and Prebisch on import substitution. M. Kobayashi, *Japan's industrialization and privatization of government enterprises (Nihon no kogyoka to kangyo haraisage)* (in Japanese) (Tokyo: Toyo Keizai, 1977) on the Interior Ministry; Raul Prebisch, *The Economic Development of Latin America* (New York: United Nations Press, 1950), trans. of *El desarrollo económico de América Latina y alguno de sus principales problemas* (Santiago: CEPAL, 1949).

⁵⁹ These weapon factories and some other SOEs were transferred from the Tokugawa state.

requiring payment in coin from 1873 on. This plus earnings from state-owned mines reduced the state's exposure to agricultural prices. From 1871 through 1875, the government's primary balance (tax revenues less ordinary expenditures excluding interest) remained marginally positive.

But this could not finance thoroughgoing modernization. The state therefore borrowed. Its first bond issue raised £1 million at 9% in London in 1870 to finance state railways, with duties and future railway profits as collateral. A second London issue in 1873 raised a further £2.4 million at 7% due in 30 years for warlords and samurai pensions. These were abruptly terminated in August 1876 – freeing up the funds.⁶⁰ This issue was collateralized by general revenues plus up to 400,000 ton of rice, worth about \$16 million – slightly more than the annual interest. In total, these two issues netted ¥16 million.

Japan issued no more foreign debt until the Sino-Japanese War. But the government now appreciated the advantages of debt markets over the private (and secret) debts the Tokugawa incurred from merchants. From 1872 through 1883, a succession of domestic debt issues to raised ¥292 million – a huge amount.⁶¹

Their fiscal situation deteriorated sharply in 1877, when suppressing the Seinan Uprising – Japan's last feudal rebellion – cost ¥41.57 million, roughly 70% of the previous year's budget. The government managed the immediate crisis by borrowing ¥15 million and printing ¥27 million in inconvertible paper currency.⁶² The soaring money supply fuelled inflation, which induced the National banks to quicken their presses. Japan was now in an unsustainable inflationary spiral. The Finance Minister, Masayoshi Matsukata, resolved to confront the crisis with a dual reform.

His monetary reform unified the currency. Previously only coinage was official, and private national banks issued banknotes in currencies of their choice. Matsukata created the Bank of Japan in 1886 to

⁶⁰ These cost ¥ 17.67M annually – a third to half the normal budget, and benefited about 1% of the population – 467 lords and about 320,000 samurai. In lieu, the state granted them 30 year bonds, so it netted (allowances less interest) only ¥6M annually. Subsequent inflation greatly eroded the real value of the obligation.

⁶¹ Domestic bond issues raised ¥23M in 1872, ¥22M in a sequenced issue from 1873 through 1875, ¥17M in 1874, ¥174M in 1876, ¥12M in 1878, and ¥44M in a sequenced issue from 1880 through 1883. For comparison, the national budget for 1876 was about ¥60 million.

⁶² In the late 1860s and 1870s, government paper currency was not convertible to gold. The *dajokansatsu*, introduced in 1868, was the first government paper currency usable throughout Japan. A legal reform let numbered national Banks, modeled on US national banks, issue paper money in their own currencies.

issue one official currency, the yen, backed by silver.⁶³

His fiscal reform was a general belt tightening, slashing subsidies and raising money by privatizing SOEs *en masse*. The SOEs hemorrhaged money, and Matsukata's predecessor, Shigenobu Okuma, was fired amid a political struggle after proposing a mass privatization in 1880.⁶⁴ Matsusaka, finding virtually every SOE, save a few mines, a looming fiscal disaster, recognized mass privatization as the only escape from economic and political collapse.

Accepting economic liberalism was inescapable. Initially, this was grudging. Subsidies slowly fell for many SOEs, but continued for maritime shipping, railways, and silk. But resistance faded as fiscal crisis loomed, and ending all subsidies soon seemed imperative.

Matsukata initially merely slashed SOE subsidies and shelved plans for new SOEs. This hardened SEO budget constraints. As in modern transition economies, this improved governance.⁶⁵ From mid-1878 on, each SOE provided detailed income statements and balance sheets. Remarkably, the state previously only tabulated aggregate expenditures and revenues of all SOEs! These reforms had three key effects.

First, modern accounting made SEO managers' budgetary excesses visible to their superiors.⁶⁶ This instilled appreciation for economic reality, and undercut lobbying for expanded subsidies.

Second, the worst SEO money drains was evident, raising political pressure to privatize them. SEO balance sheets also gave politicians book values, reflecting past subsidies to each. These were substantial, and the prospect of recovering these amounts through privatizations seemed increasingly attractive.

Third, dissenting voices reiterated that SOEs were intended to pull the whole economy towards

⁶³ Japan switched from silver to the gold standard in 1897.

⁶⁴ M. Harada, *Japan's Modernization and Economic Policies (Nihonno kindaikato keizai seisaku)* (in Japanese), Tokyo: Toyo Keizai (1972).

⁶⁵ On government failures associated with SOEs, see Andrei Shleifer and Robert Vishny, "Politicians and Firms," *Quarterly Journal of Economics* 109, no. 4 (1994): 995-1025. Matsukata's reforms are described in detail by Garrett Droppers, "Monetary changes in Japan," *Quarterly Journal of Economics* 12, no. 2 (1898): 153-185; Ministry of Finance, *History of public finance in the Meiji period (Meiji zaiseishi)*, (in Japanese), in 14 volumes, Maruzen, Tokyo, 1904-5; and Muroyama, Yoshimasa, "Mechanisms of the Matsukata deflation (Matsukata deflation no mechanism)," (in Japanese), in Umemura, Matatsugu, and Nakamura, Takahusa, *Matsukata finance and industrial development policies (Matsukata zaiseito shokusan kogyo seisaku)*, (in Japanese), University of Tokyo Press, 1983, 127-155.

⁶⁶ See Andrei Shleifer and Robert Vishny, *The Grabbing Hand* (Harvard University Press, 1998) for a general discussion of the importance of transparency in limiting lobbying; and Andrei Shleifer and Daniel Treisman, *Without a Map: Political Tactics and Economic Reform in Russia* (MIT Press, 1999) for a discussion of these issues in Russian reformers' strategies.

comprehensive modernization, with gains in some offsetting losses in others.⁶⁷ Some of this was likely disingenuous, for at least some sectors should have posted gains. But the crisis made SOEs justify benefits against realistic cost assessments, including opportunity costs recoverable via privatizations.

A few SOEs escaped the mass privatization – military suppliers, mints, government printing, railways, postal services, and telegraphs. But military suppliers judged obsolete or unimportant were privatized, and private railways and military suppliers displaced SOEs as subsidies ended and SOEs sold off plant and equipment. With few exceptions, SOEs were on the block.

4.3 Mass Privatization

The state privatized twenty-six large SOEs by 1896. The model was the Takashima mine, nationalized in 1874, then sold to its manager, the merchant and Meiji politician Shojiro Goto, in 1875. Goto financed the deal, essentially a management buy-out (MBO), with debt, including a loan from the British firm Jardine, Matheson.⁶⁸ Production rose, but earnings struggled to cover hefty interest costs. Still, the government paid \$400,000 to nationalize the mine and got ¥550,000 privatizing it less than a year later, netting ¥190,000 at prevailing exchange rates.⁶⁹ Repeating this with other SOEs promised fiscal salvation.

The first mass privatization attempt was an 1880 law offering fourteen money-losing SOEs at gross book value (book value with no depreciation allowance) to buyers screened by officials for financial resources – though not ability or expertise! Unsurprisingly, virtually no buyers appeared.

Under escalating fiscal pressure, and reluctantly conceding that most SOEs were not worth their gross book values, the government passed another privatization law in 1884, offering profitable state-owned mines to the highest bidder.

Japan's major private mining business remained aloof. The Sumitomo ran the Besshi copper mines

⁶⁷ Kevin Murphy, Andrei Shleifer and Robert Vishny, "Industrialization and the Big Push," *Journal of Political Economy* 97 (1989): 1003-1026.

⁶⁸ See John McMaster, "The Takashima Mine: British Capital and Japanese Industrialization," *The Business History Review*, 37, no. 3 (Autumn, 1963): 217-239 regarding Jardine, Matheson's role in management.

⁶⁹ An average market exchange rate for 1871-1873 was £1.00 = ¥ 4.5 yen = \$5.00; or \$1.00 = ¥0.90; see Kunitake Kume, ed. *Real experience of America and Europe (Beio kairan jikki)* (in Japanese) (Tokyo: Iwanami, 1996).

for the Tokugawa, and the Meiji government confiscated these as state property in 1868. Soon realizing they needed Sumitomo expertise to operate the mines, the government reversed itself a month later. But Sumitomo's general manager, Saihei Hirose, distrusted the government and bid for no SOEs in this or subsequent privatization rounds. His only reaction was to hire expert engineers away from former SOEs.

In contrast, Mitsui, bid enthusiastically in every major privatization round. Its major purchases were the Shinmachi and Tomioka silk textiles mills, bought in 1887 and 1893, respectively.

The Iwasaki too entered the fray. Shojiro Goto was struggling to keep Japan's first privatized SEO, the Takashima mine, out of bankruptcy. Yataro Iwasaki once worked under Goto, but showed no interest until an elaborate sales contract was drafted in 1881 by the Meiji statesman Yukichi Fukuzawa.⁷⁰ The contract imposed strict financial conditions on the departing Goto, but gave Mitsubishi clear title after a one-time payment terminating the mine's debts.⁷¹ Mitsubishi paid ¥859,636.45, ¥259,636.45 to the state and ¥600,000 to Takashima's creditors. Iwasaki saw the mine's remaining reserves and salvage value as marginal, but apparently sought political capital by rescuing Goto.⁷²

He imposed modern accounting and management, radical changes after Goto's chaotic governance. In 1882, he fired three miners for sleeping on the job, presaging sweeping layoffs at the overstaffed mine.

Iwasaki found a colliery useful, for Mitsubishi's "national champion" status hinged on shipping, which required coal. Mitsubishi could also export coal in otherwise empty freighters during low-volume winter seasons and exploit supply shortfalls in Shanghai. Most importantly, Takashima gave Mitsubishi expertise applicable in other mines.

Mitsubishi acquired twenty more coal mines from 1884 through 1911. Eleven were large-scale operations that compensated for Takashima's falling output. The expertise developed at Takashima proved invaluable, for coal was essential to Japan's rising chemical and heavy industries, positioning

⁷⁰ Yukichi Fukuzawa (1835 - 1901) was a highly regarded Meiji leader – an educator, author and political theorist.

⁷¹ See M. Kobayashi, *Japan's industrialization and privatization of government enterprises (Nihon no kogyoka to kangyo haraisage)* (in Japanese) (Toyo Keizai, Tokyo, 1977).

⁷² Iwasaki calculated that the mine contained 1,500,000 tons, implying eight more years of operation and earnings of ¥1,125,750. This fell short of his estimate of mine's accumulated debt at that time by ¥128,250, but his estimate of the mine's salvage value in eight years was ¥200,000. His reserves estimate was excessively conservative, for the mine continued producing until 1986.

Mitsubishi well to retain its “national champion” status and attendant political influence.

But, perhaps unsurprisingly, being a “national champion” ultimately became a liability. By the late 1870s, rival politicians took to attacking Mitsubishi for manipulating shipping and passenger fares. After two major Mitsubishi supporters, Toshimichi Okubo and Shigenobu Okuma, retired, more politicians attacked Mitsubishi for redirecting shipping subsidies to other businesses.⁷³

In 1882, the government ordered Mitsubishi to restrict itself to shipping or forego further subsidies. Sensing an opportunity, the Mitsui had organized a maritime shipping firm, Kyodo Unyu Kaisha, with military personnel as CEO and vice-CEO. Generous subsidies let Kyodo Unyu cut sharply into Mitsubishi's shipping revenues, which fell from ¥4.6 M in 1881 to only ¥2.3 M by 1883. Kyodo Unyu had 29 ships with a 28,010 ton total capacity by 1881, rivaling Mitsubishi's 29 ships and 36,599 ton capacity.⁷⁴ Iwaskai and the Mitsui appreciated the merits of cooperation, and merged their shipping lines in 1885 to form Nippon Yusen Kaisha, renamed Nippon Yusen Kabushiki Kaisha (NYK).⁷⁵ The merger also let Mitsubishi remain in mining and diversify further.

Mitsubishi developed ship maintenance, shipbuilding and iron production in Yokohama, its primary port. These facilities were gargantuan, with 1882 sales revenue of ¥187,338, assets of ¥119, 986, and over a hundred thousand employees.⁷⁶ In 1887, Mitsubishi bought another major SOE, Nagasaki Shipyards, which it operated at the government's request since 1884. Citing the increasingly vociferous political attacks on Mitsubishi, Kobayashi suggests the lease and subsequent purchase of the money-losing Nagasaki Shipyard were forced upon Mitsubishi to weaken the Iwasaki.⁷⁷ If so, they quickly turned the

⁷³ Pyramidal group controlling families often have complex relationship with governments; see Tarun Khanna and Yishay Yafeh. “Business Groups in Emerging Markets: Paragons or Parasites?” *Journal of Economic Literature* (2007 forthcoming).

⁷⁴ M. Kobayashi, *Japan's industrialization and privatization of government enterprises (Nihon no kogyoka to kangyo haraisage)* (in Japanese) (Toyo Keizai, Tokyo, 1977).

⁷⁵ NYK was the first joint stock company registered under the 1893 Revised Commercial Code, which endowed listed companies with many standard features, including limited liability. H. Mito, Katsube, N., and H. Ikeuchi, *Corporations* (in Japanese) (Yuhikaku, Tokyo, 1999) and S. Tomooka. *What is a stock company?* (in Japanese) (Tokyo: Kodansha, 1998).

⁷⁶ M. Kobayashi, *Japan's industrialization and privatization of government enterprises (Nihon no kogyoka to kangyo haraisage)* (in Japanese) (Tokyo: Toyo Keizai, 1977).

⁷⁷ Contemporary rumors of Naval Ministry takeover or a lease to Kyodo Unyu, the former Mitsubishi shipping's main competitor, proved false. Other rumors viewed the initial lease as a plot to weaken Mitsubishi by ex-samurai bureaucrats. Mitsubishi survived fierce competition from Kyodo Unyu, which struggled and failed to pay any dividends. Forcing the money-losing shipyard on Mitsubishi would allegedly weaken it while helping the state and Kyodo Unyu. M. Kobayashi, *Japan's*

tables, massively expanding and modernizing the shipyard and restaffing it with graduates of Japan's new engineering universities and others with modern training. Mitsubishi transformed the money-losing SOE into Japan's premier ship building facility. By 1895, Nagasaki Shipyard was the undisputed industry leader, having built Japan's first government-standard rank 1,392-ton ocean liner, the Suma.

[Table 1 about here]

Table 1 provides details of the Meiji mass privatization, listing the most important SOEs divested, details of the transactions, and both the immediate and ultimate buyers.

[Figure 1 about here]

For the most part, the Meiji government's burnt fingers kept its hand out of the economy in subsequent decades.⁷⁸ After the mass privatization, Japan established only one new state-owned enterprise – Yawata Steel – in 1901, and Figure 1 shows subsidies to business remaining small until World War II blurred the lines between the military and industry. This fiscal probity let Japan return to bond markets when necessary to sustain government spending and refinance old debts. The government raised ¥45M from 1884 through 1889, and floated a ¥175M sequenced issue from 1886 through 1897.

5. Zaibatsu Big Pushes

The Mitsui, Mitsubishi, and other wealthy families, despite ongoing earnings from traditional businesses, lacked capital to buy more than a few SOEs. This handful whet their appetites for profit opportunities

industrialization and privatization of government enterprises (Nihon no kogyoka to kangyo haraisage) (in Japanese) (Tokyo: Toyo Keizai, 1977).

⁷⁸ Hidemasa Morikawa, *Zaibatsu: the rise and fall of family enterprise groups in Japan*, (Tokyo, University of Tokyo Press, 1992) p. 57 writes “: "During the first twenty years of Meiji rule, the government had intervened to support industrialization in the private sector by encouraging the spread of the company system and the accumulation of capital by entrepreneurs. By the 1890s, however, the state had cut back on its direct role in the economy, giving way to private corporations.”

further afield; but seizing these would require pooling capital with outsiders, risking the dishonor of the Shimomura and Ohmura.

5.1 Pyramidal Business Groups

Fortunately, a solution presented itself – the “pyramidal business group”. This structure, apparently devised earlier in the 19th century by British trading firms, let a wealthy family (or individual) use public investor’ money to control corporate assets worth vastly more than its own wealth.⁷⁹ By the late 19th century, pyramids existed in the United States, Canada, Europe, and elsewhere. By the 1920s, they were a preferred structure for big businesses throughout the world.⁸⁰

The Japanese variant of the pyramidal business group is called a *zaibatsu*.⁸¹ As elsewhere, *zaibatsu* were multi-tiered structures with a lead business at the apex. Figure 3 illustrates. The apex firm holds equity control blocks in a first tier of listed companies. Each of these, in turn, holds control blocks in a second tier of listed firms. Each of these, in turn, holds control blocks yet other listed firms. In each tier, public investors own all remaining shares in each firm.

[Figure 3 about here]

Pyramids have several advantages.⁸² First, by controlling the apex firm, a wealthy family controls essentially limitless tiers of listed firms. The apex firm controls 51% of the votes in every first tier firm, and so appoints whomsoever it pleases, usually family members, to their boards. These firms control 51%

⁷⁹ Randall Morck, Daniel Wolfenzon and Bernard Yeung, “Corporate Governance, Economic Entrenchment and Growth,” *Journal of Economics Literature* 43 (2005): 657-722.

⁸⁰ Randall Morck, *A History of Corporate Governance around the World: Family Business Groups to Professional Managers* (Chicago: University of Chicago Press, 2005).

⁸¹ We define *zaibatsu* to include any large pyramidal group with listed firms controlling other listed firms. This distances the term from issues of origin, control, monopoly power, and land rents; which some Japanese scholars hold as definitional. It also distinguishes the pyramidal *zaibatsu* from the horizontal *keiretsu* business groups of postwar Japan, which lack apex firms and pyramidal structures. Literally *zaibatsu* means “wealthy group”. Japanese economic and business historians debate the precise definition of a *zaibatsu*. The literature generally dates *zaibatsu* to the period after World War I, the Mitsui, Sumitomo, and Mitsubishi pyramidal groups predate that era by many decades and are the models for subsequent *zaibatsu*. Shigeaki Yasuoka, *Japanese zaibatsu (Nihonno zaibatsu)* (Tokyo: Nikkei, 1976).

⁸² For further details regarding each advantage, see Randall Morck, Daniel Wolfenzon and Bernard Yeung, “Corporate Governance, Economic Entrenchment and Growth,” *Journal of Economics Literature* 43 (2005): 657-722.

of each second tier firm, so the latter's boards are appointed by the boards of the former, who are appointed by the family. In this manner, the family controls every firm in the pyramidal group.

Second, the apex firm's controlling shareholder needs only a modest fortune because the pyramidal business group is mainly financed by public investors. The listed firms in the first tier are 49% financed by outside shareholders. Those in the second are 49% directly financed by outside shareholders and 51% financed by first tier firms, which are also 49% financed by outside shareholders. The net result is that second tier firms are 74% financed by outside shareholders. Firms in the third tier are 85.25% financed by outside shareholders, and those in the fourth tier are 92.25% financed by outside shareholders. Lower tier firms are successively more thoroughly financed by public shareholders.⁸³ Despite this, every firm is still controlled by the apex firm's controlling shareholder. Berle and Means stress this stark separation of ownership from control in pyramids, and argue that it induces seriously suboptimal management.⁸⁴

Third, pyramids magnify the political and economic clout of the controlling shareholder.⁸⁵ Wealthy families controlled most *zaibatsu*. A few, like the Nissan *zaibatsu* had widely held apex firms. But Aikawa and his family controlled Nissan's board, so here too pyramiding magnified a family's power.

Fourth, existing firms' earnings can finance control blocks in new firms. The controlling shareholder needs no additional funds to control new firms created in existing or new lower tiers of the group.⁸⁶

Finally, the family is protected from lawsuits. Each firm is separately incorporated and listed. Each has distinct shareholders. And multiple layers of limited liability shield the controlling shareholder from legal problems afflicting lower tier firms.

⁸³ Continuing this example, listed firms in the n^{th} tier are $1 - \alpha^n$ financed by external shareholders, where α , the intercorporate control stake, is 51% in this example. A 51% stake is often unnecessary for effective control if most shareholders fail to vote, the control stake shares have multiple votes, or debt and non-voting preferred shares are added to the mix. Cross-holdings – shares held by firms not in the level immediately above, but elsewhere in the pyramid – further complicate the arithmetic in real pyramidal groups. See Lucien Bebchuk, Reinier Kraakman, and George Triantis, "Stock Pyramids, Cross Ownership and Dual Class equity: The Mechanisms and Agency Costs of Separating Control from Cash Flow Rights," in *Concentrated Corporate Ownership*, ed. Randall Morck (National Bureau of Economic Research Conference Volume, University of Chicago Press, 2000).

⁸⁴ Adolf Berle and Gardiner Means, *The Modern Corporation and Private Property*. (New York: Macmillan, 1932).

⁸⁵ Randall Morck, *A History of Corporate Governance around the World: Family Business Groups to Professional Managers* (University of Chicago Press, 2005) and Randall Morck, Daniel Wolfenzon and Bernard Yeung, "Corporate Governance, Economic Entrenchment and Growth," *Journal of Economics Literature* 43 (2005): 657-722 discuss this immense political influence in many countries – both historically and presently.

⁸⁶ Heiter Almeida and Daniel Wolfenzon, "A Theory of Pyramidal Ownership and Family Business Groups," *Journal of Finance* 61 (2006): 2637-81.

In most ways, *zaibatsu* resembled pyramidal groups in other countries, and Japanese academics call pyramidal groups elsewhere *zaibatsu*. However, some peculiarities merit note. Most *zaibatsu* owned land and mines, initially (Sumitomo) or following the mass privatization (Mitsui and Mitsubishi). Mines, especially, were cash cows that financed control stakes in new subsidiaries. Also, *zaibatsu* had *sogo-shosha*, or general trading companies. Through these, *zaibatsu* bought and sold all goods, gleaned market information to guide entry into new industries. *Sogo-shosha* also served as *de facto* banks, with trade credit replacing loans. This helps explain a third peculiarity, aversion to debt.

These characteristics combine to facilitate *big push* growth. One controlling shareholder controls all group firms, can make customers and suppliers grow in tandem, and can siphon money between firms as needed. National savings is tapped on a huge scale, since the group is predominantly financed with public equity issues. The controlling shareholder has an interest in the profitability of the entire group, and in laws and regulations that benefit the economy overall. And the group can finance ventures into new industries using the retained earnings of existing group firms. Thus, we propose that Japan's *zaibatsu*, its pyramidal business groups, decided to take over direction of Japan's 'big push' – not because the government asked them to, but because the government had withdrawn its hand and each *zaibatsu* could now tunnel earnings from one industry into profitable investments in others. Each *zaibatsu*, quite likely acting alone and for profit, thus did precisely what Rosenstein-Rodan asked of the State.⁸⁷

5.2 The Mitsui Pyramid

The Mitsui constructed Japan's first *zaibatsu*. Whether they devised pyramiding independently or imitated foreign pyramids is unclear. The group began in 1876 when Mitsui Bank, then the Family Council's control center, divested Mitsui Bussan. Since the bank's owners bore unlimited liability, it

⁸⁷ Paul Rosenstein-Rodan, "Problems of Industrialization of Eastern and South Eastern Europe," *Economic Journal* 53 (1943). We find no evidence that the State directed the *zaibatsu*-led big push, that they coordinated it with each other, or indeed that they coordinated production in any way. The Revised Commercial Code of 1890 allowed cartel contracts between producers, but also let firms freely exempt themselves and freely withdraw. After Russo-Japanese War, cartels were organized in a few industries, including sugar and oil. But most Japanese economic historians see industrial organization as competitive until the late 1920s. In fact there is evidence that firms with large shareholders, such as Sumitomo *zaibatsu* firms, avoided cartel contracts. On all these points, see Miyajima (2004), pp.49-50, and references therein.

avoided risky high return ventures. These Mitsui Bussan undertook. To protect the bank, Takenosuke and Yonosuke Mitsui, representing two major Mitsui clans, legally renounced their birthrights and were formally cast out by the family. Takenosuke and Yonosuke assumed ownership of Mitsui Bussan, which funneled Mitsui money into various risky ventures, including maritime shipping.

This limited the family's downside, absent formal limited liability. A contract specified Mitsui Bank's limited liability for Mitsui Bussan obligations, obligations of each to the family should the other fail, salaries Mitsui Bank paid Takenosuke and Yonosuke, and that Mitsui Bank controlled Mitsui Bussan.

This finely crafted document let Mitsui Bussan take risks intolerable to other families, and earn fat commissions shipping coal from the state-owned Miike mine to politically volatile China, gaining political capital by fattening state coffers. The Mitsui repeated this separation of ownership from control wherever a business grew risky. Thus, when Japanese clothing sales flagged in 1873, the silk clothing store was transferred to the newly created Mitsukoshi, owned by distant relatives. Again, a contract established Mitsui Bank's control over Mitsukoshi and limited the bank's liability. In each case, one Mitsui firm controlled another without owning it. Thus, some date the formation of the Mitsui *zaibatsu* to 1876.⁸⁸ The Sumitomo followed suit with similar structures shielding family wealth from downside risk.

After much trial and error, civil and commercial codes were announced in 1880, though implemented much later. A Civil Code passed in 1888, and the Company Law Section of the first Commercial Code in 1893. These formalized limited liability, rendering controlled subsidiaries unnecessary to block liability. Yonosuke and Takenosuke Mitsui quickly revised their birth certificates to restore their Mitsui lineage, and Mitsui Bank assumed ownership of Mitsui Bussan and Mitsukoshi. But Japanese controlling shareholders were now used to separating their businesses into distinct companies.

By the late 1890s, after several additional legal reforms, the Mitsui group began to tap public equity. Although most Mitsui businesses remained unlisted, the Mitsui Partnership, the group's apex firm, through the Mitsui Bank, held control blocks in Oji Paper and Kanegafuchi Boseki (Kanebo) Textiles,

⁸⁸ Shigeaki Yasuoka, *Mitsui Zaibatsu* (in Japanese) (Tokyo: Nikkei, 1982): 90).

with public shareholders owning the remaining shares.⁸⁹

Mitsui mines were cash cows – producing earnings the Family Council could redirect into other companies as they diversified from silk business into banking, which provided financial services to their customers and suppliers; electrical equipment, which their modernized mills required; and then other more diverse industries that became relevant as Japan's growth accelerated. This succession reflects precisely the industry complementarities envisioned in the big push.⁹⁰

This developing pyramidal structure let Mitsui organize new joint stock companies to expand into additional lines of business from the late 1890s through the early 1920s. Soon, most Mitsui firms were listed, for promising investments outpaced the family's wealth, necessitating public equity issues. But all firms in the group remained under Mitsui Partnership control, directly or indirectly. The family's actual ownership, though, varied. Figure 3 depicts the *zaibatsu* in 1914.

[Figure 3 about here]

Mitsui Partnership retains full ownership of three of the four first tier firms through 1921, but reduces its stake in the rapidly growing Mitsui Bank from 100% to 67.2%, even as the book value of its holdings rises from ¥20M to almost ¥43.6 M. The expansion is thus predominantly financed with public shares.

Figure 3 groups remaining firms into *affiliates*, second tier firms, and *related* firms, located in lower tiers. Again, substantial public equity infusions erode the family's percentage stakes even as their value rises. Thus, the book value of family holdings in Oji Paper rose from ¥4.35 M in 1914 to ¥5.23 in 1921, while its ownership stake dropped from 72.5% to 31.6%.

The increasingly complex pyramidal structure, with more tiers of controlled listed firms, let the Mitsui reposition firms to their advantage. Morikawa argues that higher tier firms attracted greater family

⁸⁹ The Mitsui Council functioned as a holding company, with various committees and departments but was not a corporation and therefore could not own property. Actual operating businesses were owned directly by the family from 1898 to 1909.

⁹⁰ Kevin Murphy, Andrei Shleifer and Robert Vishny, "Industrialization and the Big Push," *Journal of Political Economy* 97 (1989): 1003-1026.

“concern”, and hence posted higher profitability and lower risk.⁹¹ But, key firms in low levels belie this. Mitsukoshi, heir to the ancestral silk business, moved to a low tier after its 1904 transformation into a department store chain. Oji Paper and Kanebo, firms of national prominence, also placed in low tiers; as did Shibura Engineering Works, which merged with Tokyo Electric to form Tokyo Shibura (Toshiba) Electric in 1939.⁹² General Electric confirmed Shibura’s importance when it bought a 25 to 30% stake in 1904 for technology licensing.

It seems plausible that firms were positioned to maximize the family’s returns, while minimizing its risk. Putting highly profitable low risk firms in the top tier accomplishes this, Korean pyramidal group restructurings in the late 20th rearranged firms at prices favorable to controlling families, so changes in *zaibatsu* structures might be similarly motivated.⁹³ However, firms might also be repositioned to facilitate tunneling – to facilitate big push growth, to concentrate net profits in firms owned directly by the family, or both. This too is consistent with superior performance of firms higher in the pyramid, and the location of many clearly important firms in lower tiers.⁹⁴

Records attest that Mitsui Partnership carefully considered which firms to place where, and what stake each should hold in others. As the *zaibatsu* grew more complex from 1912 to 1930, lower tiers were periodically restructured, but the upper tier changed little. Mitsui Bank, Mitsui Bussan, Mitsui Mining

⁹¹ Hidemasa Morikawa, *Zaibatsuno keieishiteki kenkyu (Business history research of zaibatsu)* (in Japanese) (Tokyo: Toyo Keizai, 1980), 46-57.

⁹² Hidemasa Morikawa, *Zaibatsuno keieishiteki kenkyu (Business history research of zaibatsu)* (in Japanese) (Toyo Keizai, Tokyo, 1980) proposes some Mitsui managers and partners recognized the importance Shibaura’s operations without understanding them. The Mitsui considered divesting Shibaura in 1902, but opposition from Mitsui Mining and others forestalled this. Shibaura went public as a Mitsui company in 1904.

⁹³ Kee-Hong Bae, Jun-Koo Kang and Jin-Mo Kim, “Tunnelling or value added? Evidence from mergers by Korean business groups,” *Journal of Finance* 57, no. 6 (2002): 2695-2741.

⁹⁴ On tunneling, see e.g. Stijn Claessens, Simeon Djankov, Larry H.P. Lang, “The separation of ownership and control in East Asian Corporations,” *Journal of Financial Economics* 58, no. 1-2 (2000): 81-112, Stijn Claessens, Simeon Djankov, Joseph Fan, and Larry Lang, “Expropriation of minority shareholders in East Asia,” *Journal of Finance* 57 (2002): 2741-2771, Mara Faccio and Larry H.P. Lang, “The Separation of Ownership and Control: An Analysis of Ultimate Ownership in Western European Countries,” *Journal of Financial Economics* 65, no.3 (2003): 365-395, M.P. Bertrand, P. Mehra and S. Mullainathan, “Ferretting out tunneling: an application to Indian business groups,” *Quarterly Journal of Economics* 117 (2002): 121-148 and Simon Johnson, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, “Tunneling,” *American Economic Review* 90, no. 2 (May 2000): 22-27. Recent work suggests that tunneling is more common in countries whose minority shareholders are poorly protected, like Japan in this era. Even in the 1990s, Rafael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer, Robert W. Vishny, “Trust in large organizations,” *American Economic Review* 87, no. 2 (1997): 333-338 assign Japan one out of six in an international comparison of shareholder rights. Michael Porter, *The Competitive Advantage of Nations* (New York: Free Press, 1990) argues that weak shareholder rights advantaged Japanese companies by freeing their managers from myopic shareholders; but Randall Morck and Masao Nakamura, “Banks and Corporate Control in Japan,” *Journal of Finance* 54 (1999): 319-339 dispute this.

and Toshin Warehousing remained Mitsui Partnership direct subsidiaries.⁹⁵ The only significant change added Mitsui Life Insurance and Mitsui Trust Bank to the first tier after 1912.⁹⁶

Mitsui's intensive diversification began with Mitsui Mining's entry into chemicals in the early 1910s. The Mitsui textiles business needed dyes, and a Mitsui chemicals firm grew apace with the textiles operation. Mitsui Bussan founded a shipbuilding firm in 1917 to complement its export business, bought steel mill in 1924 to supply its ship building and electrical equipment operations, and established Toyo Rayon to enter artificial fibers. This coordinated diversification wave occurred exclusively through new subsidiaries of Mitsui Mining, Mitsui Bank and Mitsui Bussan, or new subsidiaries of subsidiaries.

The growth of the Mitsui zaibatsu seems consistent with a privately orchestrated big push enabled by the increasingly active public equity markets. The state declared many of these industries priorities, but subsidies were now checked by legislators' reluctance to undermine public finances again.

Instead, the Mitsui turned to equity markets. Statutes precisely defining the nature of a business corporation and the rights and liabilities of its shareholders made stocks and bonds viable ways for people to save. The Mitsui responded to each such legal reform with more share issues, increasingly using public equity issues as necessary to expand existing firms or enter new industries.⁹⁷ By 1909, most Mitsui subsidiaries were listed.

Older upper tier subsidiaries – Mitsui Bank, Mitsui Bussan, or Mitsui Mining – typically controlled newer high-growth companies, which drew on public equity (and some debt). Thus, earnings from Mitsui Mining and Mitsui Bussan helped capitalize high growth subsidiaries in chemicals, machinery, shipbuilding and maritime shipping. These ventures fulfilled government development plans, but public share issues, not subsidies, funded their growth. In contrast, Mitsui's ancestral silk business, now the

⁹⁵ In a 1909 restructuring, the Mitsui Bank spun off its warehousing operations as Toshin Warehousing Co. Toshin's shares were unlisted and held entirely by Mitsui companies and families.

⁹⁶ See Hajime Tamaki, *History of Japanese Zaibatsu (Nihon Zaibatsushi)* (in Japanese) (Shakai Shisosha, Tokyo, 1976), 84-86. W. Mark Fruin, *The Japanese Enterprise System: Competitive Strategies and Cooperative Structures* (New York: Oxford University Press, 1992), 100-102 describes how the Mitsubishi pyramid was reorganized several times between 1916 and 1926, and argues that this reflected evolving strategic considerations such as economies of scope and scale.

⁹⁷ H. Miyajima, *Economic history of industrial policy and corporate governance: micro analysis of Japanese economic development* (in Japanese) (Tokyo: Yuhikaku, 2004). This behavior validates arguments in La Porta, Rafael, Florencio Lopez-De-Silanes, Andrei Shleifer, Robert W. Vishny. "Legal determinants of external finance" *Journal of Finance* 52, no. 3 (1997a): 1131-1150 about the importance of law to public equity investors.

financially staid Mitsukoshi Department Stores, controlled no major subsidiaries and sat quietly in a lower tier. Mitsui's pyramidal structure seemed generally consistent with Mitsui Partnership channeling earnings and public savings into high growth industries, consistent with a big push.

5.3 The Great Pyramids of Japan

The Mitsui zaibatsu was the first great Japanese pyramidal business group. The others, the Mitsubishi, Sumitomo, and Nissan zaibatsu, grew similarly, and ended up with similar structures. These expansions also accord with zaibatsu head offices supplanting the state in coordinating big push growth.

The Mitsubishi Pyramid

Mitsubishi, of course, kept the best double entry accounting records. These let us see *big push* coordination in action. Each operating unit had to remit its annual profits less depreciation to the head office, for reallocation.⁹⁸ From 1897, two percent daily interest on excess working capital due the partnership insured timely compliance.

The partnership distributed these profits across the group to cover losses at weaker firms and finance expansions at firms with growth opportunities. The head office thus devolved management but controlled operating and investment budgets at each location. This let it orchestrate the growth of each business so as to maximize the Iwasaki family's returns as the zaibatsu expanded. One exception to this, the Mitsubishi Bank, acquired in 1895, remitted only one tenth of its profits, and so served as a second earnings reservoir for the group. This rendered it more secure in depositors' eyes, but still let the Iwasaki allocate lending by dint of their controlling equity block.

Distant Iwasaki relatives held "income shares", and enthusiastically used their dividends establish new companies. This practice developed so the Iwasaki could operate other businesses while Mitsubishi obeyed a one-time state edict to focus on shipping or forego subsidies. The practice outlived the edict, and

⁹⁸ We translate *jigyobu* as operating unit. The term describes a division in a conglomerate as well a firm's operations pertaining to a specific particular product line

Iwasaki relatives formed Meiji Life Insurance, Asahi Glass, Kirin Beer and other ventures that built up the pyramid. These were managed independently, but remained dependent on head office capital.

The head office relied on operating unit managers for information about viable investment opportunities.⁹⁹ Devolving capital budgeting to these managers therefore seemed reasonable. Thus, from 1909 on, the minerals mining operation followed the bank's lead and retained 90% of its profits. Other mining, shipbuilding, and sales operations followed in 1911; and the real estate operating unit went a step further, remitting only 6% of its profits.

Earnings merely accumulated in many profitable operating units, so the head office soon widely reinstated full remission. Thus, the minerals mining operation, after retaining ¥1.65 million in 1911, resumed full remissions in 1912. The coal mining unit's ¥1 million retention in 1913 likewise triggered restoration of the old rule. These ventures served Mitsubishi better as profit centers, for growth opportunities lay elsewhere. This failed experiment in investment devolution highlights the head office's coordinating function – the role of *big push* planners.

The shipbuilding operating unit, in contrast, continued retaining 90% of its earnings despite accumulating over ¥1 million in a single year. Presumably the head office felt the operating unit had viable growth opportunities.

Mitsubishi fully modernized accounting procedures throughout all operations at this time. Operating units consolidated balance sheets and income statements for each location and passed the information to Mitsubishi Limited Partnership. The head office then set retention levels, borrowing, and capital budgets for each operating unit. This let the operating unit managers finance investments directly related to their own operations, but also let the head office coordinate the growth of the different operating units and finance diversification into new industries.

Thus, Mitsubishi's growth, formerly financed with state subsidies, now drew mainly on retained

⁹⁹ Hidemasa Morikawa, *Zaibatsu: the rise and fall of family enterprise groups in Japan*, (Tokyo, University of Tokyo Press, 1992) p. 105 notes that “the survey of salaried managers during the formative period of the zaibatsu leaves the strong impression that such managers were highly oriented to national goals and relatively well educated. Graduates of Tokyo Imperial University and Keio Gijuku University were especially enormous. Their education had prepared them to seek as businessmen to enhance their country's place in the world.” Such broadmindedness would perhaps help group firm managers accept decisions detrimental to their firm, but beneficial to the overall group.

earnings. Profitable operating units with growth opportunities financed their own expansion. Growth elsewhere depended on Mitsubishi Bank loans and earnings redeployed by the head office. After World War I, coal mining and shipbuilding profits financed major expansions in iron works, shipbuilding and banking. The highly profitable mining operating units, especially, had scant growth opportunities of their own. Very occasionally, especially when head office profits were low, Iwasaki family money was also plowed back into Mitsubishi.

But expansion was still financed internally, or with bank depositors' money. Internal funds proved insufficient to finance the burgeoning growth of the 1920s. Mitsubishi Mining was the first to list in 1920, raising ¥14.84 at its initial public offering (IPO). One by one, other Mitsubishi operating units listed, and started issuing more shares to fund growth. Mitsubishi share offerings raised a total of about ¥45 million from 1920 to 1931.¹⁰⁰ Further offerings in the early 1940s brought in many times more. These offerings often entailed an established firm listing, and then using the funds raised to finance new subsidiaries rather than growth in its own operations. For example, the first major Mitsubishi listing, Mitsubishi Mining, had more sufficient earnings to cover its own investment needs.

From the early 1920s on, these equity issues steadily diluted the Mitsubishi Limited Partnership's equity stakes in its listed operating subsidiaries – from an average of 85.5% in 1921 to only 69% by 1928.¹⁰¹ To stem this dilution, these subsidiaries took to financing growth by issuing shares in their own subsidiaries, rather than issuing more of their own shares. Thus, by 1928, the Mitsubishi group had a standard pyramidal structure.

Mitsubishi firms' bank debts shrank rapidly, disappearing by 1928. Mitsubishi Bank's 1929 IPO raised ¥13.72 million, and a subsequent seasoned offering raised another ¥5.87 million. The Mitsubishi Bank now lent mainly to unrelated firms, and thus held a highly diversified loans portfolio that helped it survive the 1923 Great Kanto Earthquake and the Great Depression. A few Mitsubishi companies issued

¹⁰⁰ Y. Mishima, *The Mitsubishi Zaibatsu* (in Japanese) (Tokyo: Nikkei, 1981).

¹⁰¹ Though a large part of this dilution involved equity sales to Iwasaki relatives.

bonds, though.¹⁰² Other groups, like the Suzuki *zaibatsu*, which relied mainly on their banks rather than equity issues, generally did not survive those crises.¹⁰³

The Sumitomo Pyramid

The Sumitomo eschewed the Meiji mass privatization, and diversified more slowly than the Mitsui or Mitsubishi. Sumitomo accumulated profits from its Besshi copper mine, but its manager, Saihei Hirose, opposed diversifying into banking. Sumitomo Bank was established only in 1895, after his departure. Nevertheless, it grew rapidly through the early 1900s, soon eclipsing Mitsubishi Bank.

Sumitomo diversification likewise lagged, as did issuing shares. Sumitomo let the others test the pyramidal group model first, and then moved quite quickly. Like the others, Sumitomo diversified first into businesses complementary to mining, its core business, and then more broadly. Sumitomo acquired several distressed firms during Japan's deep post World War I recession.¹⁰⁴ Some of this diversification seems opportunistic. For example, the Sumitomo took over Japan-US Sheet Glass, a troubled Mitsubishi joint venture, in 1922 and replaced all its managers. The rechristened Nippon Sheet Glass prospered and, by 1930, essentially monopolized Japan's flat glass market along with Mitsubishi's Asahi Glass.

But the diversification's thrust was entry into industries complementary to existing operations. The Sumitomo expanded from copper mining to large-scale bulk copper and wire production; and from iron and coal mining into large-scale iron and steel production. Increasingly sophisticated business dealings required commensurate banking services, so the family established Sumitomo Trust Bank in 1926. Shipping and storing valuable metals and metal products required insurance, so they acquired Hinode Life in 1925 and Fuso Marine Fire and Casualty in 1930. Large-scale coal mines were better sustained if coal had alternate uses, so Sumitomo Chemicals ventured into ammonia/nitrogen fertilizer production at new

¹⁰² Mitsubishi Shipbuilding issued ¥10 M in bonds in 1918, Mitsubishi Warehousing ¥5 M in 1928, Mitsubishisha ¥30 M in 1938, Mitsubishi Heavy Industries ¥30 M in 1938; and Mitsubishi Mining ¥75 M in 1942-43.

¹⁰³ Randall Morck and Masao Nakamura, "A Frog in a Well Knows Nothing of the Ocean: A History of Corporate Ownership in Japan," in *A History of Corporate Governance around the World: Family Business Groups to Professional Managers*, ed. Randall Morck (Chicago: University of Chicago Press, 2005), 367-459.

¹⁰⁴ H. Hatakeyama, *Formation of Sumitomo Zaibatsu (Sumitomo zaibatsu seiritsushi no kenkyu)* (in Japanese) (Tokyo: Dobunkan Shuppan, 1988).

coal-based chemicals plants in 1928.

The Sumitomo's inexhaustible cash cow, the Besshi Copper Mine, continued yielding healthy profits, but Mitsui and Mitsubishi mining operations both generated nearly twice its profits by 1909. While Sumitomo Bank grew to rival Mitsubishi Bank, Sumitomo's overall diversification lagged, and its businesses remained smaller in scale than their Mitsui and Mitsubishi peers through the early 1900s. The first Sumitomo listing was Sumitomo Fertilizer in 1934, when the family finally came to terms with the need to tap public equity markets to diversify further.¹⁰⁵ From this point on, the Sumitomo diversified more energetically with rapid-fire share issuances.¹⁰⁶

The Nissan Pyramid

The fourth of Japan's great *zaibatsu*, Nissan, has a different provenance. The Mitsui and Sumitomo pyramids grew from old family wealth. Mitsubishi grew with the newly wealthy Iwasaki family. Nissan, in contrast, was built entirely with public shareholder wealth virtually from its outset – perhaps because the pyramidal model was already proved when Nissan, the youngest of the four, was conceived.

Nissan was formed by the initially impecunious Husanosuke Kuhara and his brother-in-law, Yoshisuke Aikawa. By 1919, Kuhara controlled 30% of Japan's copper mines, 40% of its gold mines, and 50% of its silver mines; all financed with a ¥2.4 million IPO to capitalize his Kuhara Mining. Japan prospered during World War I, but subsequent downturns weakened Kuhara Mining and ultimately bankrupted its subsidiary, Kuhara Trading. The ailing Kuhara retired, leaving Aikawa in charge. An engineer with state-of-the-art iron US training, Aikawa successfully steered his much smaller Tobata Cast Iron through the economic turmoil. To save Kuhara Mining, he pooled his money with that of relatives, managers, and outsiders to inject over ¥25 million into that company. Against all expectations, he saved Kuhara, became a director in 1926, and then became president. To restore the firm's long-term health,

¹⁰⁵ H. Miyajima, *Economic history of industrial policy and corporate governance: micro analysis of Japanese economic development* (in Japanese) (Tokyo: Yuhikaku, 2004: 218-220).

¹⁰⁶ *Ibid.*

Aikawa needed capital. In 1928 he issued shares in a new holding company, Nippon Sangyo (Nissan) and used the proceeds to capitalize Nippon Mining, which he then merged with Kuhara Mining. Since Kuhara was already listed, this left Nippon Mining publicly held, but controlled by the widely held Nissan.

The older zaibatsu families clearly understood the advantages of public equity, but balanced these against privacy and undisputed control. This balance limited public shareholders' participation, for it required unambiguously dominant control blocks throughout the pyramid. The apex firm of the Nissan group, in contrast, was widely held, and could issue shares to create new subsidiaries, like Nippon Metal, or acquire control blocks in already listed companies.

Aikawa rapidly built Nissan into a large, diversified *zaibatsu*, though machinery remained its most important business. His technical expertise, still rare in Japan, made him irreplaceable to the group's core profit centers, so Aikawa needed no control blocks.¹⁰⁷ This let Nissan expand rapidly, since equity-financed mergers and acquisitions (M&A) permitted faster growth than constructing new facilities.¹⁰⁸

Aikawa preserved Nissan's technology focus, for its major diversification was into heavy industries, chemicals, and electric power. Unafraid of public equity, but averse to debt because of Kuhara's near bankruptcy, Aikawa saw no need for Nissan to control a bank, and kept Nissan firms' leverage moderate.

The big push logic underlying the expansion of the Mitsui, Mitsubishi, and Sumitomo *zaibatsu* relies on circumstantial evidence. But Aikawa makes the logic explicit for Nissan in Figure 3, taken directly from his autobiography. Here, Aikawa models Nissan and its directly owned subsidiaries to a plumbing system, in which water represents capital.

[Figure 3 about here]

Nissan was listed and Aikawa had to keep its shareholders satisfied. He accomplished this with a

¹⁰⁷ This sort of situation is also thought to lock in control in some US firms. Andrei Shleifer and Robert Vishny, "Management Entrenchment: The Case of Manager-Specific Investments," *Journal of Financial Economics* 25 (1989): 123-139.

¹⁰⁸ M. Udagawa, "New Zaibatsu (Shinko Zaibatsu)," in *Japanese Zaibatsu*, ed. S. Yasuoka (Nihonno Zaibatsu) (Tokyo: Nikkei, 1976), 107-144).

slowly rising dividend, flowing through the central pipe of the five extending downwards from his ‘public holding company tub’ representing Nissan, the pyramid’s apex firm. The valve in that pipe is turned so as to drain the central compartment of that tub, Nissan’s retained earnings, slowly enough that fluctuations in its water level never alter its dividend flow into the public capital tub at the bottom of the diagram. Nissan’s other two compartments are filled with capital from securities issues (left) and the sale of treasury securities (right).

Nissan’s many operating subsidiaries are represented by the smaller capital tanks across the top of the diagram. The level of water in these is kept constant across the subsidiaries by their drainage into a common pipeline to Nissan and their own public investors. Note especially the prominent bidirectional valves on a pipe linking their primary inflow and outflow pipes. By adjusting these, as well as the flow directly out of the top of the holding company tub, Aikawa can raise or lower the common level in all the subsidiaries. By carefully adjusting the one-way valves on the inflow pipes to each, he can prevent profitable ones from accumulating capital and less profitable ones from draining empty. A parallel system of debt financing pipes tapping water from a financial institutions tub completes the picture.

Morck and Nakamura correctly note that Figure 3 describes tunneling.¹⁰⁹ But closer inspection suggests tunneling to sustain a big push. The plumbing is arranged to keep a constant level of water across subsidiary tanks – so those with large investment needs do not run dry and so those with few investment needs do not overflow. Aikawa specifically justifies using overall profits to subsidize losses in key firms, and investing in “a few new business lines” that would lose money, but were nonetheless “important to the nation” and likely to augment Nissan’s long run financial health.¹¹⁰ These ventures included an auto manufacturing firm, subsequently named Nissan Motor, an Antarctic whaling business, and a broadcasting company.¹¹¹ This cross-industry and intertemporal subsidization, financed by current earnings from a constellation of industries, is precisely what big push development strategists envision.

¹⁰⁹ Randall Morck and Masao Nakamura, “A Frog in a Well Knows Nothing of the Ocean: A History of Corporate Ownership in Japan,” in *A History of Corporate Governance around the World: Family Business Groups to Professional Managers*, ed. Randall Morck (Chicago: University of Chicago Press, 2005).

¹¹⁰ Yoshisuke Aikawa, *New Capitalism and Holding Companies* (Tokyo, Bankers Association, 1934) p. 13.

¹¹¹ Udagawa, M. “New Zaibatsu” in *Japanese Zaibatsu* ed. S. Yasuoka (Tokyo: Nikkei, 1976) pp.134 and 142.

As Nissan grew, Aikawa carefully structured voting blocks and crossholdings so every listed subsidiary was unambiguously controlled by other group firms. This was presumably necessary because *big push* growth requires firms in some industries to subsidize those in other industries. While this might optimize overall gains for the group, as reflected in Nissan's own share price, shareholders of subsidiaries conscripted to provide subsidies might 'hold up' the transaction to seize the group's economic profits.¹¹² Wielding a control block let Aikawa marginalize tetchy shareholders under such circumstances.¹¹³

Nissan's share price rose steadily through the Great Depression, allowing repeated equity issues to finance opportunistic M&A in the bear market of the 1930s. His broad strategy was to buy promising firms, develop them as fully owned subsidiaries, and then refloat them via partial IPOs. In creating these spin-offs, or *bunshin kaisha*, Nissan resembled modern US private equity firms.¹¹⁴ However, the latter usually sell all their shares to the public to raise funds for the next venture, while Nissan always retained a control block, using further IPOs to extend the pyramid. This let Aikawa channel earnings from across the widely diversified group back to Nissan, and thence to other group firms.

Aikawa constantly recognized his duty to keep Nissan's dividends on track, so other listed group firms were managed to benefit the apex firm.¹¹⁵ To Aikawa, this mandated broad group diversification to provide Nissan low-risk cash inflows. Subsidiaries in many industries meant a downturn in one was likely to be offset by an upturn in another. When the government began accumulating gold in 1932, Nissan sold Nippon Mining shares and used the proceeds to diversify further. By 1937, the group included Nippon Mining, Hitachi, Ltd., Hitachi Power, Nissan Motor and numerous other large manufacturers and utilities.

Nissan grew rapidly, surpassing Sumitomo as the third largest zaibatsu by the 1930s; and its apex holding company grew successively more widely held. Its shareholder base rose from 20,000 in 1934 to

¹¹² Oliver Williamson, "Transactions-Cost Economics: The Governance of Contractual Relations," *Journal of Law and Economics* 22, no. 2 (1979): 233-62 and Oliver Williamson, "Credible Commitments: Using Hostages to Support Exchange," *American Economic Review* 73, no. 4 (1983): 519-40.

¹¹³ An alternative strategy, of combining all Nissan operations into a single widely held company could also have prevented such shareholder hold up problems. One possible advantage of the pyramidal structure might have been that Aikawa could tunnel earnings into Nissan give its shareholders a generous return at the expense of selected subsidiary shareholders even during downturns.

¹¹⁴ Paul Gompers and Josh Lerner, *The Venture Capital Cycle* (MIT Press, 2002).

¹¹⁵ Yoshisuke Aikawa, *New Capitalism and Holding Companies* (Tokyo, Bankers Association, 1934).

51,804 in May 1937. Although 98% of the latter held fewer than 500 shares, these small investors collectively owned over 50% of the Nissan's equity. Only 33 shareholders owned over 10,000 shares, and the Aikawa family's combined stake totaled only 5.2% in 1937.¹¹⁶

Nissan's listed subsidiaries prospered on average, further enriching both Nissan's shareholders and their own. Listed subsidiaries formed or acquired more lower tier subsidiaries, and the pyramid expanded. Nissan's own paid-in capital, ¥5.25 million in 1933, rose to ¥198.37 million in 1937, as its total assets soared from ¥91.08 to ¥383.10 million. This mainly reflected the rising value of its direct subsidiaries, for Nissan's stock portfolio rose in value from ¥53.38 to ¥269.92 million over the period.

Lesser Pyramids and Other Structures

The top four zaibatsu were widely imitated by other families and entrepreneurs.¹¹⁷ The chemistry experts Shitaguchi, Tomonori Nakano, and Nobuteru Mori modeled their widely held Nichitsu, Nisso, and Mori zaibatsu on Nissan. Masatoshi Okochi, an expert in machinery manufacture, constructed the Riken zaibatsu, again with a widely held firm at the apex.

Of prominent merchant families from the Tokugawa era, only the Yasuda clan ultimately joined the Mitsui and Sumitomo in constructing significant pyramidal groups. The Yasuda kept to finance, and never gained the prominence accorded the other two. Other *zaibatsu*, imitating Mitsubishi, arose as wealthy entrepreneurs sought to establish dynasties. Again, none grew to anything approaching the scale and scope of the top four. Finally, zaibatsu were not coextensive with Japan's business sector. By the 1920s, Japan's stock markets were large by world standards.¹¹⁸ Numerous freestanding firms also traded, and professional managers played important roles in many.¹¹⁹

¹¹⁶ M. Udagawa, "New Zaibatsu (Shinko zaibatsu)," in *Japanese Zaibatsu*, ed. S. Yasuoka (Nihonno Zaibatsu) (Tokyo: Nikkei, 1976), 107-144.

¹¹⁷ This section draws from Randall Morck and Masao Nakamura, "A Frog in a Well Knows Nothing of the Ocean: A History of Corporate Ownership in Japan," in *A History of Corporate Governance around the World: Family Business Groups to Professional Managers*, ed. Randall Morck (Chicago: University of Chicago Press, 2005), 367-459.

¹¹⁸ Yasushi Hamao, Takeo Hoshi, and Tetsuji Okazaki, "The Genesis and Development of Capital Markets in Prewar Japan," University of Tokyo working paper (2005).

¹¹⁹ Takeo Hoshi and Anil K. Kashyap, *Corporate Financing and Governance in Japan: The Road to the Future* (MIT Press, 2001). Gary Herrigel, "Corporate Governance: History without Historians," in *Handbook of Business History*, eds. Geoffrey

[Figures 5 and 6 about here]

5.4 Pyramid Power

Japan transformed itself from a feudal barter economy into a modern industrial state in one lifetime. Figure 5 shows real living standards doubling from 1885 to 1920, and tripling by World War II. Figure 6 shows a labor force only slightly more concentrated in primary sectors than in Canada or France.

The Japan that achieved this economic miracle is quite different from the Japan of today. Its financial system was market-centered, for equity finance predominated. It entrusted corporate governance to powerful families and tycoons, who organized listed firms into pyramidal groups; and likely maximized of their own wealth, concentrated in the pyramids' apex firms. Apex firm value maximization is unlikely to coincide with shareholder value maximization in any individual lower tier firm.¹²⁰

But, at least for a time, it perhaps aligned the wealthy families' and tycoons' interests with the social welfare goal of a successful *big push*, which requires that industries grow in tandem, with suppliers and customers eschewing opportunities to hold each other up and expanding in tandem. This sometimes requires one industry to lose money temporarily so another can exploit profitable growth opportunities. Pyramidal business groups give the apex firm undisputable control over a large constellation of listed subsidiaries, and subsidiaries of subsidiaries, populating many industries. The party in control of the apex firm can prevent firms from holding each other up and can coordinate cross-subsidized growth where it makes overall financial sense for the group. Whether the controlling shareholder's interest align precisely with those of a central planner selflessly coordinating a big push is a knotty problem. But a degree of alignment seems plausible.

Jones and Jonathan Zeitlin (Oxford University Press, 2006).

¹²⁰ Randall Morck, David A. Stangeland, and Bernard Yeung, "Inherited Wealth, Corporate Control, and Economic Growth: The Canadian Disease," in *Concentrated Corporate Ownership*, ed. Randall Morck (National Bureau of Economic Research Conference Volume, Chicago: University of Chicago Press, 2000).

5.5 The Pyramids' Curse

Why did Japan's big push succeed, while similar programs in Latin America, South Asia, and Africa repeatedly fail?¹²¹ We propose that Japan's unique success occurred because its feudal elite, then its reformist government, and finally its *zaibatsu* families, propitiously bowed out.

First, Japan's feudal elite was uniquely marginalized by early Meiji shock therapy. Elsewhere, traditional elites, intent on preserving their social and economic dominance, are thought to stifle growth.¹²² After the failed 1877 Seinan Uprising, Japan's feudal elite was a spent force.

The Meiji state too was propitiously marginalized. It began a classic *big push*, subsidizing SOEs in all major industries. Standard government failure problems forced a mass privatization to restore government finances. Thus burned, the state avoided subsidizing industry or establishing SOEs for several decades. This left business largely to itself. Elsewhere, big push programs remain state-directed indefinitely, magnifying political rent seeking returns. Rampant government failure, unsurprisingly, strangles growth after an initial spurt.¹²³

Japan's *zaibatsu* took over the big push, brought it to completion, and then were also abruptly marginalized. Economic development stalls when a old money families manipulate the state to entrench their status.¹²⁴ This could not happen in Japan, for the zaibatsu families were fortuitously sidelined after a

¹²¹ Easterly, William. "The Big Push Deja Vu: A Review of Jeffrey Sach's The End of Poverty: Economic Possibilities for Our Time." *Journal of Economic Literature* 44, no. 1 (2006): 1.

¹²² Daron Acemoglu, Simon Johnson, and James Robinson. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution." *Quarterly Journal of Economics* 117, no. 4 (2002): 1231-1294 describe nonwestern elites blocking growth to preserve traditional extractive economic systems. René Stulz and Rohan Williamson, "Culture, Openness, and Finance." *Journal of Financial Economics* 70, no. 3 (2003): 313-349 describe hierarchical traditions impeding financial development and hence growth. Olson, Mancur, Jr. "Rapid Growth as a Destabilizing Force," *Journal of Economic History* 23, no. 4 (1963): 529-552, models elites blocking growth to protect the favorable (to them) *status quo*.

¹²³ Anne Krueger, "The Political Economy of the Rent-Seeking Society," *American Economic Review* 64 (1974): 291-303, Kevin M. Murphy, Andrei Shleifer, and Robert Vishny, "The Allocation of Talent: Implications for Growth," *Quarterly Journal of Economics* (May 1991): 503-530 and Kevin Murphy, Andrei Shleifer, and Robert Vishny, "Why is Rent-seeking Costly to Growth?" *American Economic Review* 82, no. 2 (1993): 409-414, and William Easterly, *The Elusive Quest for Growth* (MIT Press, 2001) and William Easterly, *The White Man's Burden: Why the West's efforts to aid the rest have done so much ill and so little good* (New York: Penguin, 2006a).

¹²⁴ David Landes, "French Entrepreneurship and Industrial Growth in the Nineteenth Century," *Journal of Economic History* 9, (1949): 45-61, Randall Morck, David A. Stangeland, and Bernard Yeung, "Inherited Wealth, Corporate Control, and Economic Growth: The Canadian Disease," in *Concentrated Corporate Ownership*, ed. Randall Morck (National Bureau of Economic Research Conference Volume, University of Chicago Press, 2000), Randall Morck and Bernard Yeung, "Agency problems in large family business groups," *Entrepreneurship Theory and Practice* 27, no. 4 (2003) and Randall Morck and Bernard Yeung, "Family Control and the Rent-Seeking Society," *Entrepreneurship Theory and Practice* 19 (2004), Raghuram Rajan and Luigi Zingales, "The great reversals: the politics of financial development in the twentieth century," *Journal of Financial Economics*

couple of decades of rapid growth.

The military government, which seized power in the 1930s through assassination, blackmail, and intimidation, had a surprisingly populist – in some respects, almost socialist – ideology for a fascist dictatorship.¹²⁵ Coining an expression that echoes through financial history, the military condemned zaibatsu families for an unpatriotic “short term focus” on the current earnings and dividends of their apex firms.¹²⁶ Acting on these “concerns”, the military *de facto* took control of the investment policies and strategic decisions of the country’s great corporations. Whether *zaibatsu* families were coöpted or conscripted is debated, but the military substantially sidelined them.¹²⁷

The US occupation’s *zaibatsu* dissolution program completed their marginalization. Justified on antitrust grounds, but probably to diffuse *zaibatsu* families’ political power, the program confiscated the families’ shares and intercorporate equity blocks, and sold these into the open market.¹²⁸

Thus, Japan’s *zaibatsu* families did not become an old-money elite of the sort Haber portrays in Latin America.¹²⁹ Instead, postwar Japan entrusted the governance of its largest corporations to professional managers. The *zaibatsu* families added momentum to the big push, but then lost their hold.

Finally, Japan’s *unequal treaties* kept trade barriers low and precluded foreign investment barriers. Much work links elite entrenchment to financial insularity.¹³⁰ These treaties empowered foreign courts to

69, no. 1 (2003): 5-50, Randall Morck, Daniel Wolfenzon and Bernard Yeung, “Corporate Governance, Economic Entrenchment and Growth,” *Journal of Economics Literature* 43 (2005), and Kathy Fogel, Oligarchic family control, social economic outcomes, and the quality of government. *Journal of International Business Studies* 37 (2006): 603–622.

¹²⁵ Hatate p.56 and Udagawa pp. 107-44; see also Kobayashi. M. Kobayashi, *Japan's industrialization and privatization of government enterprises (Nihon no kogyoka to kangyo haraisage)* (in Japanese) (Toyo Keizai, Tokyo, 1977); M. Udagawa, *New Zaibatsu (Shinko zaibatsu)* in *Japanese zaibatsu (Nihonno zaibatsu)* ed. S. Yasuoka (Tokyo: Nikkei, 1976); Isao Hatate, *Japanese Zaibatsu and Mitsubishi (Nihonno zaibatsu to Mitsubishi)* (in Japanese) (Tokyo: Rakuyu Shobo, 1978).

¹²⁶ Takahashi, Kamekichi. *Analysis of Japanese Zaibatsu (Nihon zaibatsu no kaibo)* (in Japanese). Tokyo: Chuokoronsha, 1930. Also Takahashi, Kamekichi. *The Stock Company – A Cause of National Decay (Kabushiki Gaisha Bokokuron)*, 1930.

¹²⁷ Randall Morck and Masao Nakamura, “A Frog in a Well Knows Nothing of the Ocean: A History of Corporate Ownership in Japan,” in *A History of Corporate Governance around the World: Family Business Groups to Professional Managers*, ed. Randall Morck (Chicago: University of Chicago Press, 2005), 367-459.

¹²⁸ *Ibid.*

¹²⁹ For general arguments and evidence that openness checks elites, see Raghuram Rajan and Luigi Zingales. *Saving Capitalism from the Capitalists* (Princeton, Princeton University Press, 2003). For Latin American evidence, see Stephen Haber, *Political Institutions and Economic Growth in Latin America: Essays in Policy, History, and Political Economy* (Stanford: Hoover Institution Press, 2000) and Stephen Haber, *Crony Capitalism and Economic Growth in Latin America: Theory and Evidence* (Stanford: Hoover Institution Press, 2002). For a survey, see Randall Morck, Daniel Wolfenzon, and Bernard Yeung, “Corporate Governance, Economic Entrenchment and Growth,” *Journal of Economics Literature* 43 (2005): 657-722.

¹³⁰ Surveyed in Randall Morck, Daniel Wolfenzon, and Bernard Yeung, “Corporate Governance, Economic Entrenchment and Growth,” *Journal of Economics Literature* 43 (2005): 657-722.

apply foreign law to disputes in treaty concession enclaves, demonstrating a spectrum of foreign legal systems in action. These working examples let Meiji Japan devise and rapidly implement a modern legal system. The structure of a country's legal system correlated with its financial development and growth.¹³¹ Japan's stock markets were large by contemporary standards in the early twentieth century.¹³² Openness also lets imports and exports, as well as foreign capital, substitute for missing pieces of the domestic economy in a big push.¹³³

6. Conclusion

Easterly concedes Japan as exemplifying a successful big push, a government-coordinated expansion of interdependent industries that sidesteps hold-up problems.¹³⁴ That Japan joined the modern world remarkably quickly is clear. The Meiji Restoration took place in 1868, and by the end of World War I Japan was an industrial economy on par with much of Europe. But most of its big push was likely not government coordinated.

Rather, Japan's economic history suggests a *big push* can succeed under certain circumstances despite gloomy evidence to the contrary.¹³⁵ Specifically,

1. The state gives an initial shove, marginalizing traditional elites, reforming basic institutions, perhaps even subsidizing technology imports, and then withdraws its hand. This withdrawal checks government failure problems.
2. Pyramidal business groups emerge to propel the *big push*. An undisputed controlling shareholder focusing on the apex firm's value, prevents hold up problems and coordinates cross-industry subsidies, as group member firms tap public equity markets to capitalize cascades of subsidiaries

¹³¹ Jeffrey Wurgler, "Financial Markets and the Allocation of Capital," *Journal of Financial Economics* 58 (2000): 187-214.

¹³² Raghuram Rajan and Luigi Zingales, "The great reversals: the politics of financial development in the twentieth century" *Journal of Financial Economics* 69(1) (2003) 5–50, in Table 3, show Japan's stock markets to be relatively open in 1913 compared to those in Canada, the U.S., and Western Europe; and their other tables accord with this.

¹³³ See e.g. Vitor Trindade, "The big push, industrialization and international trade: The role of exports" *Journal of Development Economics* 78 (2005) 22– 48. *

¹³⁴ William Easterly, "The Big Push Deja Vu: A Review of Jeffrey Sach's The End of Poverty: Economic Possibilities for Our Time," *Journal of Economic Literature* 44, no. 1 (2006): 1.

¹³⁵ Ibid.

spanning all relevant industries. At least to some extent, this echoes what a selfless central planner coordinating a *big push* would do

3. The controlling shareholders are marginalized as the big push nears completion. This prevents entrenched oligarchy problems from reversing the big push.
4. All this is done with limited trade barriers and no barriers against foreign investment.

If this thesis is valid, Japan offers an alternative *big push* prescription for today's emerging economies.

That Japan's experience is replicable is unclear. Inefficient SOEs became a political liability in Meiji Japan – perhaps because of Confucian expectations that bureaucrats should be honest.¹³⁶ Japan's feudal elite, central planners, and zaibatsu families were auspiciously discredited in circumstances difficult to replicate elsewhere. Elites, once established, are usually hard to dislodge.¹³⁷

Our big push theory of pyramidal business groups differs from other explanations of pyramidal business groups. Business group firms may well let firms co-insure each other to spread risk.¹³⁸ Group firms may well trust each other to do business in economies where corruption stymies arm's length dealing.¹³⁹ Without denying such possibilities, we suggest a broader argument that subsumes them. The highly industrially diversified pyramidal structure common to business groups throughout the world permits a controlling shareholder to stem hold-up problems and coordinate growth across diverse complementary industries, permitting very rapid growth financed by public equity – a big push.

Further research is clearly needed to test these ideas. If our thesis is valid, diversification in

¹³⁶ Edwin O. Reischauer, *The Japanese Today: Change and Continuity* (Cambridge: Harvard University Press, Belknap Press, 1988): 85. Ronald Dore, *Taking Japan seriously: A Confucian perspective on leading economic issues* (Stanford: Stanford University Press, 1987).

¹³⁷ Daron Acemoglu, Simon Johnson, and James Robinson, "The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review* 91, no. 5 (2001): 1369-1401, Daron Acemoglu, Simon Johnson, and James Robinson. "Reversal of Fortune: Geography and Institutions In The Making Of The Modern World Income Distribution," *Quarterly Journal of Economics* 117, no. 4 (2002): 1231-1294 and Daron Acemoglu, Simon Johnson, and James Robinson. "The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth," *American Economic Review* 95, no. 3 (2005): 546-579.

¹³⁸ Takeo Hoshi, Anil Kashyap and David Scharfstein, "The role of banks in reducing the costs of financial distress in Japan," *Journal of Financial Economics* 27 (1990): 67-88 and Takeo Hoshi, Anil Kashyap, and David Scharfstein, "Corporate Structure, Liquidity, and Investment: Evidence from Japanese Industrial Groups," *Quarterly Journal of Economics* 106 (1991): 33-60.

¹³⁹ Tarun Khanna and Krishna Palepu, "Emerging Market Business Groups, Foreign Investors, and Corporate Governance," in *Concentrated Corporate Ownership*, ed. Randall Morck (National Bureau of Economic Research Conference Volume, Chicago: University of Chicago Press, 2001); Tarun Khanna and J. Rivkin, "Estimating the Performance Effects of Business Groups in Emerging Markets," *Strategic Management Journal* 22, no. 1 (2001); Tarun Khanna and Raymond Fisman, "Facilitating Development: The Role of Business Groups," *World Development* 32, no. 4 (2004): 609-628..

pyramidal business groups, at least in rapidly growing economies, should do more than spread risks. These groups should disproportionately contain firms that would risk hold up problems were they freestanding. Cross-subsidization should also balance growth across complementary industries, not just enrich controlling shareholders. In contrast, pure risk sharing implies that groups should contain firms whose returns are as little correlated as possible. We welcome further work exploring these issues more thoroughly, and hope to pursue them ourselves in subsequent studies.

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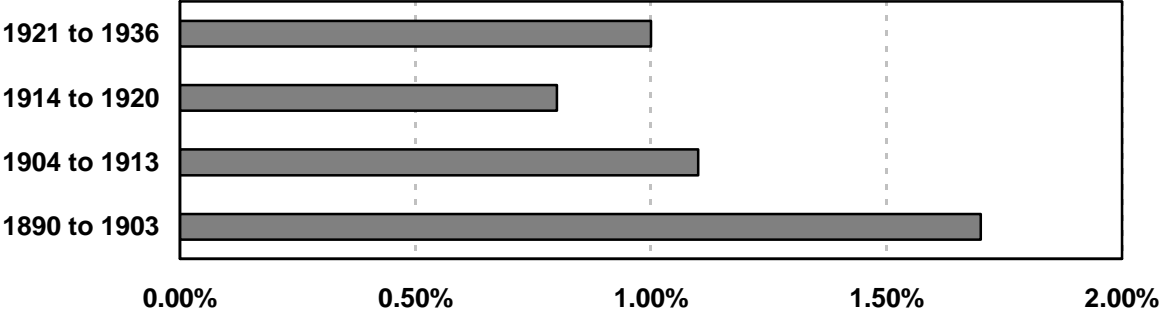
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Figure 1. Business Subsidies, 1890 to 1936

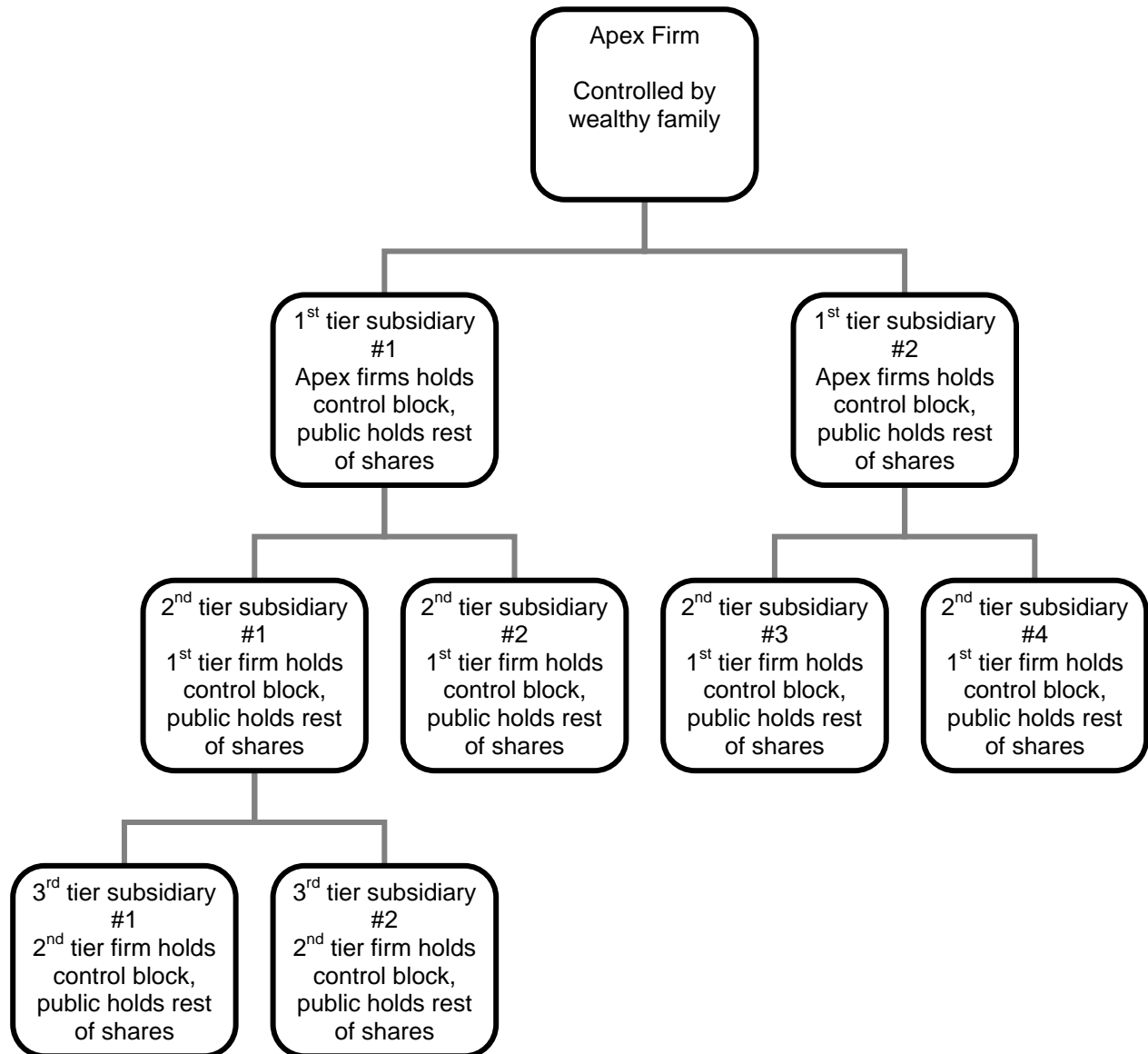
Average government subventions to business as fractions of average total government spending



Miyajima (2004).

Figure 2. Archetypal Pyramidal Business Group

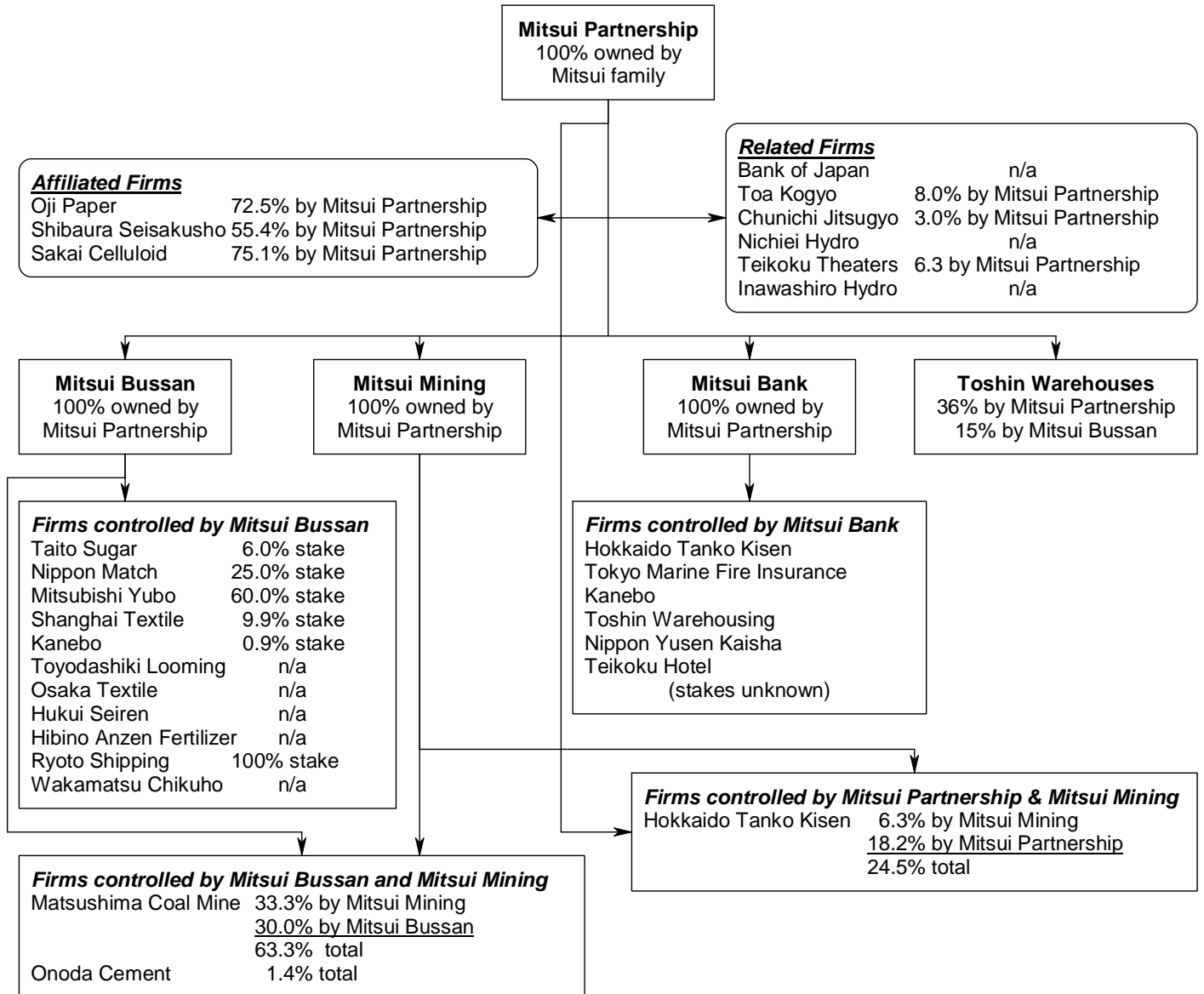
An apex firm holds control blocks in a first tier of listed firms, each of which holds control blocks in other listed firms, each of which holds control blocks in yet more listed firms. A pyramidal structure of this sort can leverage family wealth sufficient to control one firm into effectively unconstrained control over an arbitrarily large constellation of firms worth vastly more.



For details, see Morck, Stangeland and Yeung (2000), Bebchuk, Kraakman and Triantis (2000), and others.

Figure 3. The Mitsui Pyramidal Group, 1914

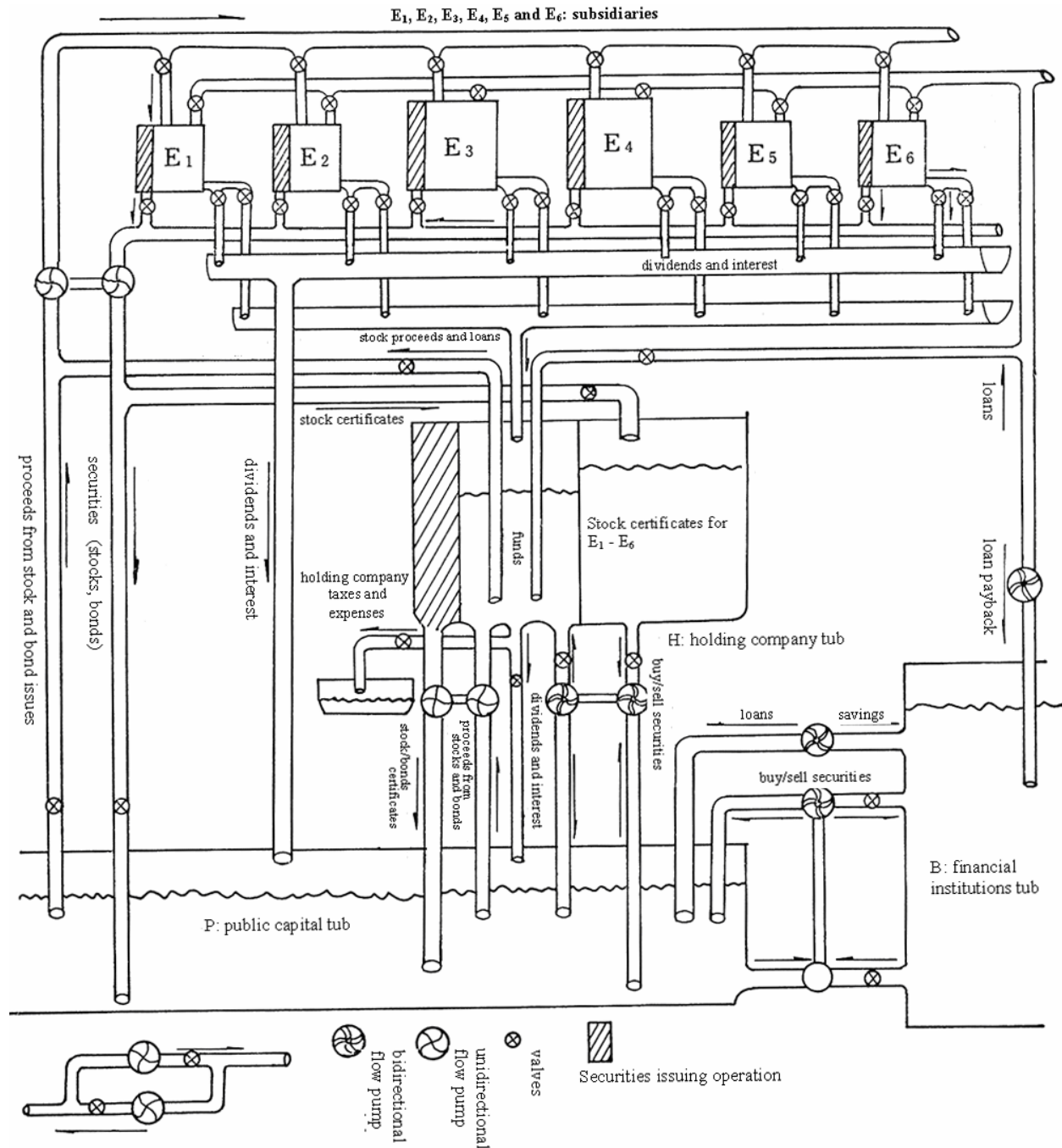
Controlling corporate shareholder's control stake is indicated where available. In some cases, control is clear but the precise size of the control block is unknown. Related firms were likely influenced, but were not unambiguously controlled, by the Mitsui Partnership.



Source. Constructed using data Yasuoka (1982, pp. 222-223) gathered from the Mitsui Archive.

Figure 4. Aikawa's Diagram of the Nissan Pyramidal Group

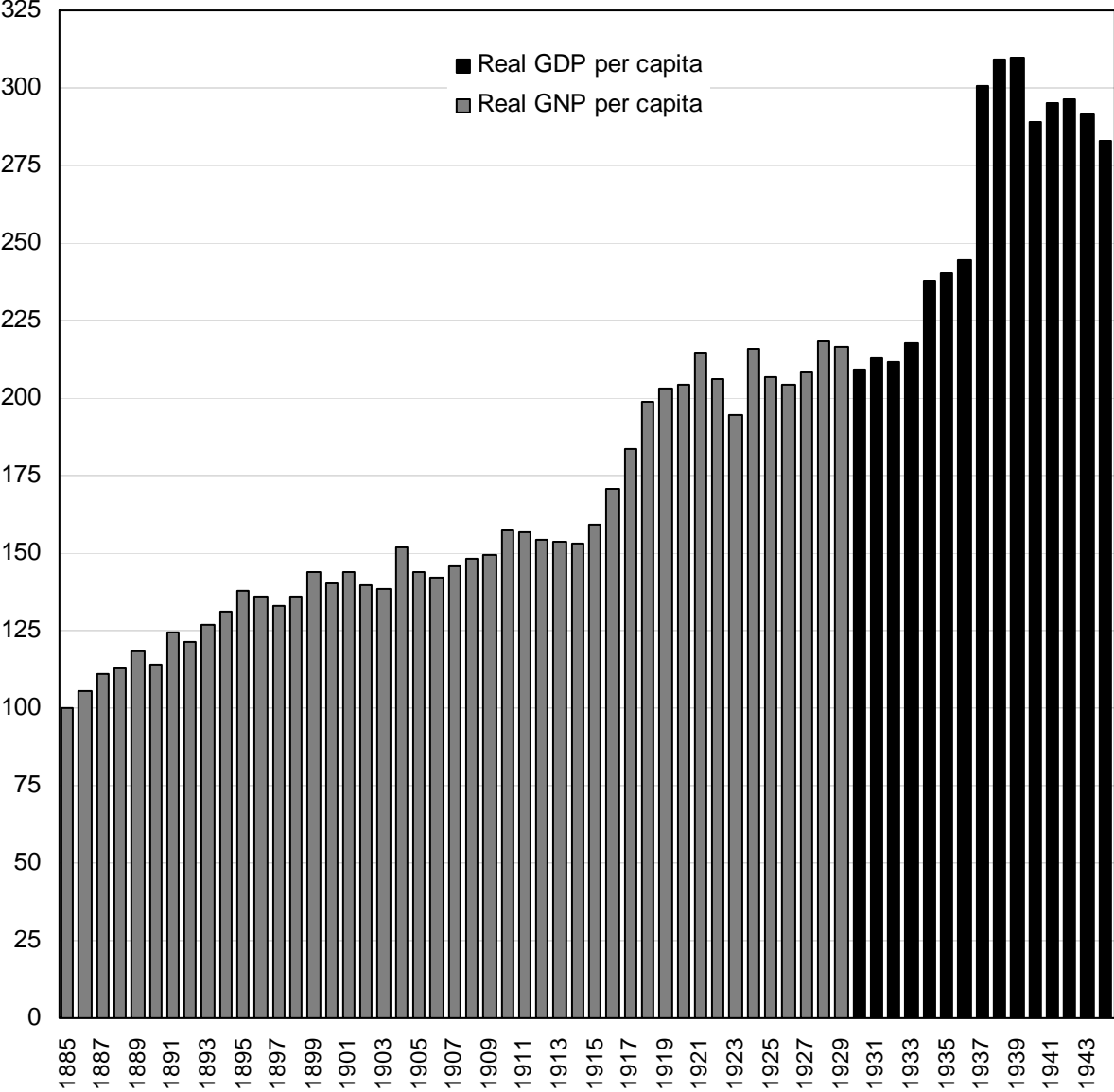
Capital is pumped from the public capital tub at the bottom up to the operating subsidiaries at the top – directly, through the Nissan holding company tub in the center, or through the financial institutions tub at the lower right. By turning one-way and bidirectional valves, Aikawa could adjust the level of capital in each operating subsidiary to its needs, subsidizing weak but necessary units with the overall profits of the industrially diversified group.



Source. Aikawa, Y. *New Capitalism and Holding Companies*. Tokyo Bankers Association, 1934. English translation by the authors.

Figure 5. Japanese Long Term Economic Growth, 1895 to 1943

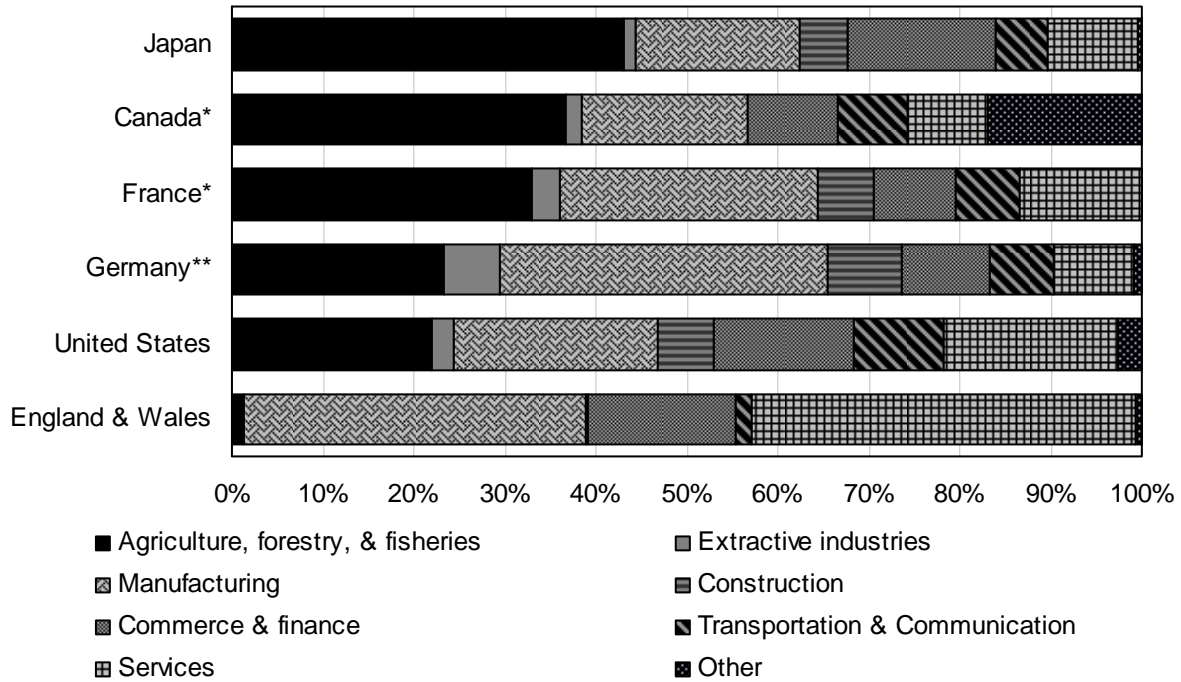
Only real *per capita* Gross National Product (GNP) is available up to 1930, after which real *per capita* Gross Domestic Product (GDP) is reported. The difference is that GDP includes economic activity by foreign firms within Japan, but excludes activity by Japanese firms abroad. GDP is now generally preferred as a measure of economy performance, but was not introduced in most countries until well into the 20th century.



Source: Mitchell (2003).

Figure 6. Industrial Structure of the Japanese Economy, 1921

The fraction of the labor force of the Japanese economy employed in each industrial sector is indicated by the shadings in the first bar. For comparison, similar breakdowns are provided for Canada, France, Germany, the United States and England (including Wales).



Notes

* 1931 census.

** 1925 census.

Source: Mitchell (2003, 2003a, 2003b).

Table 1. The Meiji Mass Privatization Program
Details of important state-owned enterprises privatized between 1874 and 1896.

Sale date	State-owned enterprise	Book value (Dec. 1885)	Est. value (June 1885)	Sale price	Initial buyer,	Subsequent buyer, sale date	Current status (successor firm)
Nov. 1874	Takashima Coal Mine	¥393,848 ¹⁴⁰	–	¥550,000	Shojiro Goto	Mitsubishi, 1881	Closed, 1986. (Mitsubishi Material)
<i>Phase I privatization</i>							
June 1882	Hiroshima Cotton Spinning	54,205 ¹⁴¹	–	12,570	Hiroshima Menshi Boseki Co.	Kaizuka Boseki, 1902	
Jan. 1883	Aburato Coal Mine	48,608	17,192	27,943	Nariteru Shirase	Mitsubishi, 1896*	Closed, 1956 (Mitsubishi Material)
<i>Phase II privatization</i>							
July 1884	Nakakosaka Iron Ore	85,507	24,300	28,575	Yahachi Sakamoto, others		Closed
July 1884	Cement Manufacturing & Fukagawa Shirorengaishi	101,559 (combined)	67,965 (combined)	61,741 12,121	Soichiro Asano Katsuzo Nichimura	Nihon Cement Shinagawa Shirorenga	Closed (Taiheiyo Cement)
Oct. 1884	Nashimotomura Shirorengaishi	–	–	101	Raizo Inaba	–	–
Aug. 1884	Kosaka Silver Mine	547,476	192,000	273,659	Shosaburo Kuhara	–	(Dowa Kogyo)
Dec. 1884	Innai Silver Mine	703,093	72,993	108,977	Ichibei Furukawa	Furukawa Kogyo	Closed, 1953 (Furukawa Kogyo)
Mar. 1885	Ani Copper Mine	1,673,211	240,772	337,766	Ichibei Furukawa	Furukawa Kogyo	Ani Kozan, 1973
May 1885	Shinagawa Glass	294,168	66,305	79,950	Katsuzo Nishimura, Eiichi Isobe	–	Closed, 1892
June 1885	Daikatsu Makiyama Gold Mine	149,546	98,902	117,142	Sen Abe	Mitsubishi, 1888	Okosawa Kozan, 1972
Nov. 1886	Aichi Cotton Spinning	58,000	?	?	Naoto Shinoda	–	Burned down, 1896
Dec. 1886	Sapporo Brewery	?	?	27,672	Kihachiro Okura	Sapporo Beer, 1887	Sapporo Beer
May 1887	Shinmachi Textile (Silk)	138,984	?	141,000 ¹⁴²	Mitsui	Yasushi Asaba, Kanebo, 1911	Kanebo Co.
June 1887	Nagasaki Shipbuilding	1,130,949	459,000	459,000	Mitsubishi	Mitsubishi Heavy Ind.	Mitsubishi Heavy Ind.
July 1887	Hyogo Shipbuilding	816,139	320,196	188,029	Shozo Kawasaki	Kawasaki Heavy Ind.	Kawasaki Heavy Ind.
Dec. 1887	Kamaishi Iron Ore	2,376,625	733,122	12,600	Chobei Tanaka	Kamaishi Kozan, 1924	Nippon Steel
Jan. 1888	Mita Agricultural Tools Mfg.	?	?	33,795	Shun Koyasu	Tokyo Kikai Mfg.	Tokyo Kikai Mfg.
Mar. 1888	Banshu Vineyard	8,000 ¹⁴³	?	5,477	Shomei Maeda		

¹⁴⁰ Nov. 1874.

¹⁴¹ June 1882.

¹⁴² ¥72,000 for factory; ¥69,000 for intangibles.

Phase III privatization

Aug. 1888	Miike Coal Mine	757,060	448,549	4,590,439	Hachiro Sasaki	Mitsui, 1889	Mitsui Coal, closed, 1997
Nov. 1889	Hornai Coal Mine & Railway	2,291,500 ¹⁴⁴		352,318	Hokkaido Tanko Tetsudo	Mitsui, 1889	Hokkaido Tanko Kisen, closed, 1989
Mar. 1890	Monbetsu Sugar Beats	258,492 ¹⁴⁵		994	Kuninari Date	Sapporo Seito, 1895	Closed, 1896
Sept. 1893	Tomioka Textiles (Silk)	310,000 ¹⁴⁶	105,000 ¹⁴⁷	121,460	Mitsui	Katakura Kogyo, 1939	Closed, 1987
Sept. 1896	Sado Gold Mine	1,419,244	445,250				
Sept. 1896	Ikuno Silver Mine	1,760,866	966,752	1,600,000 ¹⁴⁸	Mitsubishi	Mitsubishi Materials	Closed, 1973

¹⁴³ March 1888.

¹⁴⁴ Nov. 1889.

¹⁴⁵ Mar. 1890.

¹⁴⁶ Sept. 1893.

¹⁴⁷ ¥25,000 for the factory plus ¥80,000 for contracted raw silk worms.

¹⁴⁸ Mitsubishi acquired Sado and Ikuno in a package deal worth ¥2,560,926, which also included Osaka Metal Smelting and the Aburato Coal Mine.

Source: Kobayashi (1977, Table 5-1).