

HIAS-E-77

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Exchange Sizes in Germany, Japan and “Anglo-Saxon”
Economies, 1870—1950**

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November, 2018



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Corporate governance, accounting transparency and stock exchange sizes in Germany, Japan and “Anglo-Saxon” economies, 1870-1950.

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I am grateful to Professor Kyoji Fukao, the Institute of Economic Research and the Institute of Advanced Study of Hitotsubashi University, Tokyo, for hosting my research, to the staff of the Institute of Economics Library for their help with American, German and Japanese sources, and to Makoto Kasuya, Janette Rutterford, Felix Selgert and other participants in seminars at the World Economic History Congress, Boston and the Gesellschaft für Unternehmensgeschichte, Frankfurt for helpful discussion of the issues. Responsibility for any errors remains with me. Author’s email address: l.hannah@lse.ac.uk

ABSTRACT

Modern discussions of corporate governance have focused on convergence of “varieties of capitalism,” particularly the recent “Americanisation” of laws and voluntary codes in Germany, Japan, and other civil law countries. However German and Japanese legal and business historians have suggested that corporate governance, accounting transparency or other favourable factors in their countries were historically a match for - or even superior to - those in the US. An alleged consequence was deeper penetration by the Berlin and Tokyo stock exchanges of their domestic economies than of the US by the New York Stock Exchange (NYSE), using measures such as market capitalization/GDP ratios. This paper reviews the classic Rajan and Zingales (2003) data on the sizes of stock exchanges. It concludes that the evidence for Japanese historical precocity relative to the US, after the necessary allowance is made for regional stock exchanges and corporate bond finance, stands up better to this closer examination than that for Germany.

Many financial historians (e.g. Musacchio and Turner 2013) now agree that stock exchange development was not historically determined by legal origins (“Anglo-Saxon” common vs Euro-Japanese civil law), though today it appears to be driven by legal rules protecting shareholders and/or bondholders and limiting directorial autocracy and information asymmetry. However, both today and historically in some cultures private order rules (voluntary codes, bourse listing requirements, bankers as trusted intermediaries, block-holder monitoring, etc) offered substitute protections, or at least complemented protective laws. This paper reviews the plausibility of these determinants of historical stock exchange sizes - and others that have been neglected - in Japan, Germany, and elsewhere, before 1950.

JEL codes: F21, G10, G30, N20.

Keywords: legal origins, corporate governance, stock exchanges, auditing, OTC markets

Corporate governance has been defined as “the ways in which the suppliers of finance to corporations assure themselves of getting a return on their investments” (Shleifer and Vishny 1997) or, more broadly, “the design of institutions that induce or force management to internalize the welfare of their stakeholders” (Tirole 2001). Since managers have more information and live much of their lives inside the corporation, the task of outside investors (or others) aiming to “govern” the managers of corporations never was easy; and today index references to “corporation” in most economics texts lead not to discussion of their advantages but to extensive laments about “agency problems.” Yet the corporate form has massively triumphed globally: reasonable estimates of corporate numbers in the first decade of the twentieth century struggle to exceed half a million (Hannah 2015), while estimates today range up to 400 million, and the 71,000 of these that are publicly listed account for a large share of global output (Anon 2018). This corporate transformation of the global economy has happened in the face of multiple financial crises, wars, revolutions, expropriations, nationalisations, ambiguous objectives, and social discontent, suggesting that problems of governance have somehow been resolved (if surely imperfectly).

Shareholders may directly elect directors and auditors (typically at AGMs) and even remove them (by using their powers to summon extraordinary general meetings without the directors’ consent or in takeover bids), but most modern corporate laws do not otherwise envisage shareholders intervening in operations and decision-making,¹ which are separate matters for the incumbent board working with corporate management (Wilson and Thomson 2006). In the twentieth century the sources of wealth shifted somewhat from physical assets (readily financed by shareholders and bondholders with an eye on asset security) to the administrative capabilities of managerial hierarchies embodying “weightless” and often “human” capital, which, absent slavery, was substantially un-ownable and un-tradable by investors. Thus, teams of professional managers (overlapping somewhat with directors), though they had little formal role in corporate law, increasingly drove corporate strategy and innovation. They often acted as professionally-accomplished arbiters of resource allocation and the distribution of its fruits, seeing shareholders as only one (relatively passive) group among numerous stakeholders (Chandler 1990,

¹ e.g. their powers physically to inspect the books at the corporate office (not uncommon in early nineteenth century corporate charters) have been reduced to powers to appoint professional auditors, who (even if nominally acting for shareholders) are in practice beholden to management.

Lazonick 1991, 2007, 2010, 2018). A few individual companies surpassed 10,000 shareholders in the 1850s, and a half-century later 100,000 was surpassed; today some companies have more than a million investors. In such companies, direct shareholder engagement was inevitably limited. Discussions of corporate governance thus focused on roughly aligning the interests of investors and directors, whether through share sales by dissatisfied holders, bans on self-dealing by directors, independent audit and appointment committees, separation of the roles of chairman and CEO, independent or bank-appointed directors and/or directors' incentive schemes, including incentive shareholdings and options.²

World Bank researchers note that the quality of regulation and corporate governance is positively correlated with stock market size today (La Porta et al 1999, 2006, 2008), with "Anglo-Saxon" markets regulated by common law occupying the lead position and French civil law being the least conducive to stock exchange size. Their views, like the related "Washington consensus," were controversial and, following the Global Financial Crisis of 2008, even mainstream commentators have considered that economies might become too financialised, not too little (Cecchetti and Kharroubi 2015, Kay 2015, Zingales 2015). Even before that crisis, Rajan and Zingales (2003) presciently pointed out that La Porta et al under-rated European civil law countries' early financial development, though US reviewers felt they in turn underrated the US (Sylla 2006, 2011). Historians have thus spent much time in the last decade puzzling over the disputed historical facts on stock market size and corporate governance, which have implications for the modern debates. That is also the primary focus here.

I

Among societies which embraced statutory open access to the corporate form around 1870, the new German Empire developed the most ambitious and effective programme for regulating corporate governance and stock exchanges. The extensive post-*Gründerboom*

² Continental Europe pioneered these in the nineteenth century with supercharged rewards for directors - *Tantiemen* and equivalents in France, Belgium and Germany - but these proved excessive and were curtailed (Bayer and Burhop 2009) and eventually completely abandoned. Japan copied Europe in early adoption and later abandonment. The US initially lacked such innovations, but, more recently, developed different leveraged incentives in equity options: unlike earlier experimenters arguably failing to contain resulting abuses and incentive distortions.

bankruptcies of quoted German corporations - following the AG statute of 1870/1 - resembled the contemporary US experience of extensive corporate receiverships (Giesecke et al 2011).³ Americans took this in their stride, even where it involved egregious political corruption (Lamoreaux and Rosenthal 2006, White 2011), but in Germany such widespread failures were considered intolerably disruptive of acceptable norms. The new AG legislation of 1884 firmly aimed to remedy the defects. Incorporators and their underwriters were made liable for the truth of statements made to investors for two years after corporate foundation, no shareholder could be barred from AGMs or voting (new non-voting preferred shares (Vorzugsaktien) could no longer be issued), and in addition to annual balance sheets (required since 1861) annual profit-and-loss statements became compulsory.⁴ By the 1880s most railways (then - in Germany as generally elsewhere - the dominant quoted corporate securities) were delisted from Germany's speculative exchanges and taken into state ownership, so thereafter were funded by (government) fixed-interest bonds and/or taxes and administered by civil servants. Their top managers were now appointed by, reported to, and paid equity profits to government entities, not investors. The Berlin exchange had independently strengthened its listing requirements in 1882 for all issuers and in 1896 Reich regulation of stock exchanges was tightened (for example, making IPO organisers responsible for the truth and completeness of statements for five years after issue). Tighter listing scrutiny was also extended to Germany's 23 regional bourses, so they could no longer compete with Berlin by offering lower standards.⁵ Futures trading was generally banned, ostensibly to limit speculative excesses.⁶ Banks engaged in increased screening

³ In 1866-1899 an annual average of 4% of US corporate bonds by value defaulted, including a peak of 38% in the three years 1873-5 combined. In Germany the 40% overall failure rate of 1870-83 Berlin initial public offerings (IPOs) by number (Burhop et al 2018) implies an annual average approaching 3%. These statistics are not defined comparably, but in both countries investor losses in the mass of recently-issued securities were substantial.

⁴ These reforms went inappropriately far for many SMEs and in 1892 an alternative corporate form with less stringent requirements - the GmbH (resembling what was known in English as the private limited company) - was instituted, more appropriate for companies not appealing to the public for funds.

⁵ though smaller bourses were permitted to reduce the minimum issue size to half the M1,000,000 norm for Berlin, Frankfurt and Hamburg.

⁶ The NYSE had only modest options trading (Harper 1914) and on Berlin most futures were banned from 1896,

activity as gatekeepers in the IPO process, expanding the feasible portfolio frontier by mitigating information, control and transaction costs (Tilly 1992, Calomiris 1995, Burhop 2013, Lehmann 2014 FIND).

The results were on some dimensions impressive. The regulations, of course, did not completely eliminate fraud in public issues and corporate governance (for the age-old reason: as one famous robber said, when asked why he robbed banks, “that’s where the money is”). Yet the failure rate of IPOs on the main exchange in Berlin (defined as those no longer listed five years after IPO) declined remarkably from 40% in 1870-83 to 9% in 1884-1896 and only 1% in 1897-1914 (Burhop et al 2018). By 1914, 919 domestic AGs with an aggregate market value of M14.7 billion were listed on the Berlin exchange (Königlich PLM 1915) and - adding listed *Gewerkschaften* (mining companies which evaded some of the AG regulations) - the total amounted to a respectable 29% of GDP. Another thousand or so companies with securities on the 23 regional markets (after eliminating those cross-listed on Berlin) added another 4% of GDP⁷ and listed corporate bonds a further 4% of GDP (Anon 1914): 37% of GDP in total. Three independent estimates for 1913/14 produce compatible results: there is negligible disagreement on the size of German securities markets at this date.⁸ This is mainly because there was little off-exchange trading of unlisted securities, which, in Germany’s tightly regulated market, was substantially illegal.⁹ This suppression of informal markets

so some German trading migrated to London and Amsterdam.

⁷ applying the 1913 ratio (Burhop and Lehmann 2016) to the Berlin figure for 1914.

⁸ Burhop & Lehmann and Rajan & Zingales, initially unaware of the official totals for Berlin-listed AG shares reported by contemporary Prussian bureaucrats, made similar independent estimates. Their slightly higher figures for the ratio reflect the higher share prices of 1913 (also reflected in the official Prussian statistics for that year), use of NNP as the denominator and other minor definitional differences.

⁹The annual *Handbuch der deutschen Aktiengesellschaften* included twice as many AGs as were listed on German exchanges (the excess being subsidiaries of listed enterprises or unlisted). Off-exchange trading by banks was largely confined to matching bargains in *listed* domestic equities and the regulations made it very difficult for unlisted companies to appeal to the investing public for funds, though they could, of course, raise funds from banks, other enterprises, or rich individuals. The *Handbuch* prefaces bemoaned the absence of price data on such private off-exchange transactions in *unnotierte Werte*.

for external funds was not compensated by a higher level of bank lending. International comparisons suggest that Germany then qualified as a “bank-oriented” economy only through its universal banks’ extensive involvement in promoting stock exchange securities. Direct commercial bank lending to business before 1914 was only 28% of GDP, 9 percentage points lower than from German stock markets and a few percentage points below that of “Anglo-Saxon” banks (League of Nations 1931).

Some contemporary German bankers felt that excessive Reich stock market regulation unduly restricted German enterprise (Siemens 1885, Riesser 1905). Matters were somewhat liberalised in 1909 and early Weimar (1923 was an IPO peak), but from 1924 the number of AGs and listed companies in Germany began an unprecedented quarter-century decline. This was not paralleled in other rich countries, as the Nazis further restricted stock exchange issues and shareholder rights (Beer 1998, Hannah 2017, Burhop et al 2018, and see Table 1 below). By the end of 1937 all Berlin stock exchange AG shares were only 63% of their April 1927 peak level, but still 37% above par and were valued at RM11b (*Statistisches Jahrbuch 1938*, p. 424). This was only 12.5% of 1937 GDP. Judging by the 1913 ratios, adding regional markets, non-AGs and corporate bonds would have left the total for all listed corporate securities at around 18% of GDP, less than half the 1914 level.¹⁰

Even in the post-World War Two *Wirtschaftswunder*, stock exchanges experienced only a modest revival, with bank loans and bank shareholdings playing a larger part in corporate funding, newly justifying Germany’s then characterisation by the “varieties of capitalism” school as a bank-oriented economy. The changes of recent years (with the unravelling of cross-holdings and increased takeover bids) - sometimes attributed to Americanisation and certainly promoted by American investors and investment bankers - has been characterised by one German analyst, not as an alien

¹⁰ compared with 37% in 1914. Rajan and Zingales’ 1938 German ratio of 18% is identical but puzzlingly for shares only. Unlike their 1929 35% ratio (when both market/par ratios and listed par values were higher) it is faulty: comparison of their Gömmel et al (1992) source with the *Statistisches Jahrbuch* shows this 1938 figure is for the *nominal* share capital of *all* German AGs, many not listed on any German exchange. On the other hand, it excludes listed non-AGs, the premium above par of listed market values, and corporate bonds, so is compatible with my estimate for 1937.

invasion of “locusts” (as the SPD’s Franz Müntefering described them), but as a return to Germany’s pre-1914 shareholder value culture (Klages 2013). Yet Frankfurt’s Deutsche Börse (domestic capitalisation \$2.3 trillion) remains surprisingly small compared with the London Stock Exchange (\$8.4 trillion), the Japan Exchange (\$6.3 trillion), Shanghai (\$5.0 trillion), Euronext (\$4.6 trillion) or Hong Kong (\$4.4 trillion).¹¹

II

That was not true for the decades before 1914 when the Berlin exchange was growing faster than the largest European exchanges (London and Paris), and remained a proportionately larger equity market than the largest extra-European exchange, the NYSE, which had relatively weak regulation. As late as 1914 the NYSE remained largely a market for rail securities (where accounting transparency was required by Interstate Commerce Commission regulations), while in Germany - since the 1880s state acquisitions - railways accounted for a negligible share of Berlin’s corporate equities.¹² Yet, despite this massive American lead in the rail sector, the market value of all NYSE-listed shares in July 1914 was \$9,226m, only 24% of US GDP, less than half of this in non-rails, that is financial, utility and industrial shares (Comptroller 1915, *Annalist* 1916). This non-rail sector accounted for almost the whole of the proportionately larger Berlin total of 29% of GDP, so by this relative measure was more than twice the size of the equivalent NYSE non-rail sectors.

Some American financial historians - who devote a great deal of effort to explaining how New York’s financial precocity enabled the US to attain its clear industrial dominance in the new “American century” - find this impossible to believe. There is thus a Panglossian - and necessarily innumerate - US literature explaining why the NYSE was then highly developed (De Long 1991, Coffee 2001, 2012). Yet even the NYSE’s own in-house economist - who was an accomplished

¹¹ not to speak of the NYSE (\$23.1 trillion) and NASDAQ (\$10.4 trillion): all measured on 30 April 2018.

¹² Only 5% of Berlin AG share values were railways in July 1914 (most tramways, not major railways), compared with 53% on the NYSE (all but 3% steam railways, Comptroller 1915).

statistician - disagreed, noting that, compared to Europe, “the growth of security investing had not kept pace with the tremendously swift and enormous growth of corporate industrial enterprises here” (Meeker 1922, p. 491), a view endorsed by careful modern analysts. For example, Mary O’Sullivan’s recent book (O’Sullivan 2016) argues that the NYSE, after an exceptional burst of new issues in 1898-1902, risked becoming a market for industrial “lemons” and lagged until it further accelerated industrial equity listings from 1917 onwards.

This is compatible with Rajan and Zingales (2003) finding that in 1913 the equity capitalisation of Germany’s 24 stock exchanges still lagged France and the UK but was ahead of the five largest US exchanges (Boston, Philadelphia, Baltimore and Chicago combined with the NYSE). However, this is far from being the whole American story, for capital rarely respects formal borders if profit can be found in alternative channels. Faced with their weak *metropolitan equity* market, US investors and corporations resorted to alternative corporate securities at home and abroad. This is not the place to discuss why Americans historically favoured corporate bond finance and foreign, regional and informal stock markets, but the basic facts are clear.¹³ In 1892, at market prices the value of corporate bonds on the NYSE was 375% of the value of corporate stocks,¹⁴ and by 1914 was still 113% of the value of stocks, a much higher level of corporate leverage than in Europe. If one considers not just equities (in which European markets distinctively excelled) but adds the bonds that also financed corporations, the NYSE was well ahead: its total corporate securities/GDP ratio was 51% in 1914, compared with 32 % (also including corporate bonds) for Berlin.

Moreover, while the NYSE dominated American railway listings, well over half the securities (bonds and stocks) of industrial, utility and financial corporations were traded off the NYSE, compared with only 16% of all corporate securities in Germany solely listed on regional

¹³ For further discussion see Hannah (forthcoming).

¹⁴ Few NYSE-listed corporations issued only bonds so NYSE market leverage - the ratio of bonds to stocks - is a reasonable proxy for corporate leverage (though an underestimate to the extent that some firms issued only stocks). This was much higher than in the UK (Essex-Crosby 1937) or, a fortiori, continental Europe.

exchanges. Allowing both for the massive US corporate bond market and the large role of such over-the-counter (OTC), curb and regional markets, the overall US market for quoted corporate securities in 1914, was perhaps 110% of US GDP,¹⁵ three times Germany's 37% of GDP.¹⁶ In the interwar years the gap widened as German corporate securities wilted under military defeat, foreign expropriations, inflation and dictatorship, while in the US - despite its severe Great Depression - equities eventually came to dominate corporate bonds, as they had earlier in Europe.¹⁷

These dominant bond markets and less formal equity markets in the US were sometimes even more poorly regulated or illiquid than the NYSE until the SEC energetically standardised regulations from 1934. For many industrialists wanting to preserve accounts secrecy, bond covenants (only requiring investor control in the event of default) and regulatory slack (making it easy for boards to retain equity control relatively untroubled by stockholders) appeared an advantage. This contradicts the presumptions of the "law and finance" literature, which clearly is also missing something about the determinants of market size in focussing on equities on major metropolitan markets like the NYSE. Perhaps some rich block-holders provided alternative disciplines on corporate managements for some off-NYSE securities, leaving investors no worse off (Becht and De Long 2005). We don't know: although there was extensive contemporary criticism of shareholder scams in such markets, some quite skilled investors - J P Morgan and J D Rockefeller stand out - were perfectly happy to invest there and did so more than on the NYSE.¹⁸ Many investors in less

¹⁵ On plausible assumptions about the prices of non-NYSE stocks and corporate bonds.

¹⁶ Sylla (2006, 2011) recommended using Goldsmith's higher estimates for US stocks and bonds, apparently unaware that they included hundreds of thousands of unquoted corporations (Goldsmith 1958, 1985). In equities alone, the US lead was lower than in all corporate securities including bonds, but still well above Germany's ratio to GDP. On the other hand, Calomiris (1995) argued for proportionately larger German equity markets. Tracing his quantitative "evidence" on equity values to its sources suggests he included unquoted (including GmbH) and financial companies' equities for Germany, while excluding US equivalents.

¹⁷ By then almost all bond trading had migrated to OTC markets, though about a third of government and corporate bonds retained nominal NYSE listings (Friend et al 1959).

¹⁸ Judging by their investment inventories in the Morgan and Rockefeller archives. A priori, block-holders may damage external shareholders (by "tunnelling" etc) or benefit them (because of their stronger interest/influence in disciplining management). There is a large modern literature on the relative impact of venture capitalists, bankers and other block-holders on performance (for a recent Japanese example, see

liquid securities that were traded elsewhere than the main metropolitan markets were untroubled by their high bid-offer spreads, because they were investing for the long term (Chamberlain 1911). Moreover, the case for intermediaries monitoring and signalling quality in bond markets is somewhat stronger than that for the US's slowly developing equity markets (Flandreau 2017, Frydman and Hilt 2017).

III

How typical were the US and German experiences of countries with similar legal systems and cultural characteristics? The answer seems to be: much less in history than became the norm at the turn of the twentieth century, when the “varieties of capitalism” literature posited that there were fundamental institutional differences between “Rhenish” capitalism, also dubbed “coordinated market economies,” and “Anglo-Saxon” capitalism, also dubbed “competitive market economies” (Albert 1991, Dore 2000, Hall & Soskice 2001). The UK securities market was in the 19th and early 20th centuries unambiguously recognised by contemporaries as the world's largest. The London Stock Exchange (LSE) had early and strong government regulation of accounts publication and corporate governance for individually-chartered enterprises compared with Germany. Yet the UK had no German-style restrictions on off-exchange trading, so the LSE met considerable competition from informal markets, just like the NYSE. For the companies more perfunctorily registered under various Companies Acts from 1844, there was voluntary private order regulation by the LSE listing committee and intermediaries, stronger than on the early NYSE (Foreman-Peck and Hannah 2016, Burhop et al 2014, O'Sullivan 2015). The value of corporate securities officially listed on the LSE was larger than the NYSE or Berlin, both in absolute terms and relative to GDP. In 1914 all London-listed corporate securities amounted at market prices (£8.4b) to 347% of UK GDP, a high figure even by today's standards of extremely high financialization and even without counting the UK's many provincial and informally-traded securities.

Fukuda et al 2018), but little comparable historical work, though see e.g. Lamoreaux et al (2007).

The LSE was, however, much more international than any other exchange and much of this value reflected its dominant 19th century role in financing French, US, Indian and Latin American railroads, rather than *domestic* enterprise. In the early twentieth century 71 of the world's 100 largest corporations had at least one security quoted on the LSE and only 28 of these were British. A few German or quasi-German firms like Apollinaris & Johannis (the Perrier of the day), Liebig (meat extract invented by the eponymous German professor), Bremen Brewery, Van Den Bergh (the Dutch innovator of margarine which dominated the German market) and Nobel-Dynamit had securities listed on the LSE. As today, numerous German bankers in London were involved in arbitrage and futures operations (then discouraged in Berlin) for German and international securities. Japan was even more dependent on London: state railways and municipal utilities, Hokkaido Tanko Kisen, Keihin Electric Railway, Kanegafuchi Boseki, Industrial Bank of Japan, Hokkaido Colonial Bank, and the South Manchuria Railway were all partly funded in London. These large capital flows were almost exclusively in the form of bonds (debentures), enabling Japanese shareholders (including government entities) to maintain equity control. Most of these bonds were backed by Japanese government guarantees; they were intermediated by both British and Japanese banks operating in the cosmopolitan London market (Suzuki 1994, pp. 200-03). US corporations also extensively used the London market: the Pennsylvania Railroad (America's largest nineteenth century corporation) was listed on the LSE (and the Philadelphia Exchange) but not (until 1900) on the NYSE. In the 1890s perhaps a third of US railroad securities were owned abroad, most of them traded on the LSE (Wilkins 1989)

Deducting overseas securities¹⁹ would perhaps halve the UK corporate securities/GDP ratio, but still leave the LSE official list's domestic corporate securities at several times the Berlin or

¹⁹ Distinguishing domestic from overseas is no easy task since the UK then had as much multinational investment as the US, Germany and France combined (Jones 1996, p. 30), so more UK "domestic" companies operated substantially overseas (for example UK-headquartered Nobel Dynamite Trust had as many assets in Germany and Africa as in the UK; J & P Coats, Europe's largest industrial, had more assets in the US and Russia than in its main Scottish factory).

New York level (including corporate bonds as well as shares).²⁰ This British lead in corporate securitisation naturally contributed to a higher level of divorce of ownership from control before 1914. Family firms such as those of Ford, Morgan, Dodge, Duke, Stillman, Harriman, the Rockefellers, Guggenheims, Clarks, Proctors and Du Ponts remained representative in the US, as did those of the Siemens, Krupp, Thyssen, Hoesch, Stinnes and Haniel families in Germany or Mitsui, Murai, Suzuki, and Iwasaki in Japan. Family firms had become rarer (though by no means extinct) earlier in the UK's, wide and mature, shareholding culture driving the precocious development of modern managerial hierarchies. The striking US developments later and famously chronicled by Berle and Means (1932) lagged the more gradual and (until recently) uncelebrated early managerial revolution in the UK (Hannah 2007, Foreman-Peck and Hannah 2012, Acheson et al 2015).²¹

European markets also appear to have had some qualitative advantages over the US. They were more internationally diversified until well after World War Two and recent assessments of the LSE and Paris Bourse suggest their investors benefitted from this early globalization (Goetzmann and Ukhov 2006, Chabot and Kurz 2010, Edlinger et al 2018). Modern techniques of investing appear more developed in Europe at an early stage. The several hundred investment analysts at the *Crédit Lyonnais* in Paris were probably the foremost practitioners of research-driven value investing before 1914, with engineers and accounts specialists leading their analyses (Fridenson 2012). European investment trusts offered specialist and diversified portfolios chosen by financial experts at a lower cost than today's intermediaries (Chambers and Esteves 2014), but were rare in the US before the 1920s. British and French investment advisers shared ideas among

²⁰ though in absolute terms the NYSE was as large as LSE domestic corporate securities, if bonds are added to equities, the UK lay somewhere between the US and Germany in corporate leverage. UK and German GDPs were then about equal, but the US was more than twice their size at PPP and three times at market exchange rates.

²¹ It is no longer possible to take seriously Chandler's (1990) opposite national perspectives on the persistence of family ownership: see the view of a later successor as Harvard's Straus Professor (Jones 2018). On the other hand, Chandler's insistence that managers - not financiers - drove superior performance in large US industrials has been strengthened by subsequent research.

themselves and their clients on risk diversification, resembling in spirit and outcomes (if not mathematical precision) those of modern portfolio theory (Rutterford and Sotiropoulos 2016 and 2019, Edlinger et al 2018).²² Mathematical finance was then essentially unknown in America and largely the preserve of French and German scholars (Bachelier 1900, for example, prefigured the Black-Scholes theorem on options pricing which later qualified his American successors for a Nobel prize).

In March 1939 both the LSE and NYSE first produced comparable statistics on their total market capitalization (all shares and bonds combined): the NYSE's was then \$88,192m,²³ slightly higher than the LSE's £18,507m (\$86,613m at the depressed \$4.68 sterling exchange rate).²⁴ The LSE remained more of a global market than the NYSE,²⁵ and was now smaller in absolute terms for domestic corporate securities. The NYSE was also now less leveraged and had become as equity-oriented as the LSE,²⁶ as federal bonds issued during World War One and the New Deal crowded out corporate bonds. Authoritative US analysts (Smith 1925, Graham and Dodd 1934) increasingly touted the investment merits of common stocks, as earlier favoured by Europeans. The UK economy was, however, then little more than a quarter the size of the US at market exchange rates (compared

²² The work they praise on diversification as an investment strategy was also translated into German: Lowenfeld (1910).

²³ \$40,921m for stocks (common and preferred) at end-March (*NY Times*, 5 April 1939, p. 41) and \$47,271m for bonds, of which \$34,115m were government and \$13,165m corporate (*NY Times*, 7 April, p. 34). This gives a total of \$54,086m for corporate securities, including bonds, or 58% of GDP.

²⁴ valued at 24 March, a week earlier than the NYSE valuation. Government securities (overwhelmingly bonds with the exception of a few public board equities) accounted for £8,835m, 48% of the LSE total, compared with 39% of the NYSE's market capitalisation. This leaves £9,672m for LSE *corporate* securities, including corporate bonds, or 167% of GDP.

²⁵ At market 5% of NYSE government bonds were foreign or colonial compared with 11% of the LSE's and 5% of corporate securities were foreign companies (including US companies operating almost entirely abroad). The LSE did not yet similarly distinguish corporates geographically, but about two-fifths of LSE corporate values were then companies registered in colonies or foreign countries.

²⁶ 24% of NYSE corporate market capitalisation were bonds, 13% preferred and 63% common. The LSE did not produce similar statistics until later, but sampling suggests that equities accounted for a similar portion, while British companies used preference shares more and bonds less than US companies. This is in marked contrast to the nineteenth century when corporate bonds dominated the NYSE and equities the LSE.

with one-third in 1914): the US's more rapid growth at the technological frontier (less affected by Europe's post-1914 hot and cold wars) had apparently not been inhibited by its smaller and more volatile metropolitan stock market. Even as late as 1939, the LSE's penetration of its domestic economy remained ahead, with a domestic corporate securities/GDP ratio of perhaps 92%,²⁷ still considerably higher than the NYSE's 55%, though they were now closer together than in 1914.²⁸ Moreover, additionally allowing for the US's more dominant secondary exchanges and OTC market, the US and UK nationwide domestic corporate market capitalisations possibly now had equal ratios: though difficult to measure accurately at this date, they can be plausibly estimated at around 125% of their respective 1939 GDPs.²⁹

IV

²⁷ assuming 55% of LSE corporate securities at market were domestic. Rajan and Zingales' (2003) GDP ratio for UK domestic equities (excluding bonds), at 114% in 1938, is too high: they misinterpreted Aletti et al's (1975) mis-transcriptions and mis-translation into French of the LSE statistics, apparently deducting too few bonds and foreign securities in some sectors. For the US in 1938 their domestic equity ratio of 56% (like much contemporary statistical work, including preferred stocks as equities) is much the same as my 1939 ratio including bonds. This appears to be because I excluded foreign securities, with the difference further compounded by 1938/9 price changes and different GDP data.

²⁸ Relative to 1914 ratios (173% for the LSE and 51% for the NYSE), the LSE ratio had declined, the NYSE's slightly increased. Both the LSE and NYSE ratios had more recently peaked around September 1929 before the onset of the Great Depression: share prices were in both countries still depressed in 1939 as partial economic recovery was neutralised by war fears. Bond prices had held up better than share prices, but the London (BM) equity index had fallen by 38% between September 1929 and March 1939, and the NY (Cowles) common stock index had fallen by 59%.

²⁹ I am not aware of any 1939 estimates of total market size for either country, but assuming US secondary exchanges and OTC markets increased the NYSE total by the same ratio as for US stocks in 1949, the national (domestic) total would increase to 125% of GDP. The LSE's 1939 *Stock Exchange Official Year Book* listed 8,904 corporate securities on the LSE (about half on the official and half on the supplementary list) and - judging by the other entries and likely omissions - there were an equivalent number (a much higher portion of which would have been domestic) traded elsewhere. If there were 8,000 such domestic securities valued at an average £366,844 (the mean company security value in the LSE supplementary list, consisting principally of smaller domestic companies), their values would have added £2,935m or 30% to the LSE total (including foreign) corporate values. Assuming the latter were 55% domestic (as in the previous note), non-LSE-listed domestic companies would have accounted for 36% of quoted corporate security values, raising the overall domestic-security/GDP ratio to 143% of UK GDP. However, with values as low as £250,000 for the mean non-LSE corporate security and only 6,000 such securities, the GDP ratio would be only 118%.

Germany was *not* typical of civil law economies either before or after 1914, any more than the NYSE typified more developed “Anglo-Saxon” metropolitan exchanges. In France the Paris Bourse was almost as dominant as Berlin, but France permitted off-exchange trading of unlisted securities by provincial bankers and others, so had an OTC sector, though on nowhere near the scale of the US. The exchanges and informal markets of smaller European countries - including the Netherlands, Belgium and Norway - were initially less regulated by the state, but some were extensive and achieved a respectable level of self-regulation and considerably higher scale than Germany relative to GDP. The most interesting - and in some ways surprising - case of divergence from the German model was Japan.³⁰

In the Meiji period, Japan was, of course, poor relative to Europe and struggling to develop many “modern” economic institutions from scratch, with a determined national consensus on the need to catch up with the west. Stock exchanges were formed from an early stage (the first in 1878 was followed by dozens more), as were banks (based initially on American precedent) and other corporations (copied initially from diverse foreign examples but soon requiring individual government authorization). A free incorporation statute comparable to Britain’s of 1844/55 or Germany’s of 1870/71 was not enacted until 1899. By then Meiji autocrats had decided that Anglo-American common law was undesirably liberal: they increasingly favoured the more regimented German civil and commercial codes. The 1899 regulations for *kabushiki kaisha* (share companies, or AGs) were based on models recommended by the lead foreign consultant, the German lawyer Roesler. However, most equity transactions on the Tokyo Stock Exchange were forward trades, which were substantially illegal in Germany from 1896. Moreover, other German regulations were not fully enacted, so companies had considerably more discretion in Japan about regulatory matters and there was no perceived need for GmbH legislation of the kind Germany had found necessary to

³⁰ The following paragraphs draw extensively on my joint work with Makoto Kasuya (2016).

reduce regulatory burdens on SMEs in 1892.³¹ Switzerland already had a similar approach to incorporation that - though formally resembling Germany's - was more liberally implemented. As Table 1 shows, Japan was soon nearer to the Anglo-Saxons and Switzerland than to Germany

Table 1. Extant Stocks of (Private and Public) Corporations per million people, 1899-1999.

Year	USA	UK	Germany	Switzerland	Japan
1899	1,875	684	174	615	89
1909	2,901	1,044	341	961	117
1919	2,778	1,576	604	1,827	302
1929	3,895	2,412	851	3,177	331
1939	3,584	3,486	415	4,547	452
1949	4,121	4,974	486	4,761	2,081
1959	6,064	6,825	725	6,248	4,861
1969	8,182	9,666	1,265	10,216	7,868
1979	11,358	13,978	3,706	16,807	11,634
1989	14,605	20,181	6,513	23,198	15,527
1999	19,778	23,866	10,846	28,947	19,384

Source: Hannah and Kasuya (2016)

³¹ Similar legislation creating the *yugen kaisha* was not considered necessary until 1940 (shortly after the GmbHs late introduction to Switzerland). While in Germany GmbHs overwhelmingly dominated corporate numbers, in Japan (like Switzerland) numbers of KKs and *yugen kaisha* were about equal even as late as the 1990s.

in its number of corporations (standardised here - to facilitate comparison - as corporations per million population). Moreover, with the collapse of corporate numbers in the late Weimar and Nazi period, Japan overtook Germany in corporate penetration of its economy even before it had GmbHs (which for all countries are here combined with AGs or the local equivalents).

Of course, most companies everywhere - whether nominally “public” or “private” (in most common law countries), AGs or GmbHs (and other civil law analogues), or simply not formally distinguished (as for long in the US) - were closely-held and unquoted, but a minority were listed on stock exchanges or more informally traded.³² Such quoted companies were already more important in Japan than Germany before World War One and by 1938 their equity alone amounted to 181% of Japan’s GDP; adding Japanese corporate bonds the corporate securities/GDP ratio rises above 200%.³³ This was well over ten times that of Germany (around 18% of GDP).³⁴ Both their authoritarian governments firmly bent capitalism to their own militarist needs, but the Japanese were less ideologically committed than the Nazis to restricting corporations. Japanese investors remained optimistic in the later 1930s during the sustained economic upswing, increased militarisation and successes in the war against China formally declared in 1937. Share prices were

³² Around a third of Prussian AGs (mainly the largest ones) were quoted on a formal exchange (Königlich PSL 1912, pp. 228, 231), though, of course, none of the more numerous GmbHs. Rajan and Zingales (2003) count 389 Japanese companies quoted on Tokyo, Osaka, and some other exchanges in 1913, less than 6% of the 6,562 extant Ks.

³³ Rajan and Zingales’ 1938 ratio for Japan of 181% is based on the *Tokyo Stock Exchange Fact Book*, and Hamao et al (2009) report a ratio from the same source for all Japanese exchanges of 117% of GDP in 1936 (58% of GDP for the TSE alone). These are mutually compatible, given market/par ratios and 1936-8 stock price increases. On bank and other corporate bonds (these debentures were mainly now held by Japanese financial institutions rather than individuals, who favoured equities) see Bank of Japan 1938 and Japan Economic Federation 1940.

³⁴ Rajan and Zingales’ 1938 German ratio of 18% (unlike their 1929 35% ratio, when both market/par ratios and listed par values were higher) is faulty: comparison of their Gömmel et al (1992) source with the *Statistisches Jahrbuch* shows this 1938 figure is for the *nominal* capital of *all* German AGs, many not listed on any German exchange. On the other hand, it excludes listed non-AGs and the premium above par of listed market values. All Berlin stock exchange AG shares were valued at the end of 1937 (when they were only 63% of their April 1927 peak level, but still 37% above par) at RM11b (*Statistisches Jahrbuch 1938*, p. 424), only 12.5% of 1937 GDP and - judging by the 1913 ratios - adding regional markets and non-AGs would probably leave the total below 18%.

still above peak 1920s levels,³⁵ while in Europe and America they remained well below. This optimism helped produce Japan's high securities/GDP ratio of over 200%: not only massively bigger than Germany's, but also ahead of the US and UK (both at around 125% including bonds³⁶). This investor optimism was not entirely delusional (a devoted "rational expectations" economist would have no difficulty arguing investors were "rational"). The Japanese military did well (in the short and medium term), and the Kenpeitai were as effective as the Gestapo in suppressing contrary perspectives. The attractions to expanding businesses like the Aikawa group (with Manchurian developments complementing core investments like Nissan and Hitachi) of overoptimistic investor valuations in the 1930s were obvious (for the high level of new issues and cheap capital under cheap money policies and capital export controls in the later 1930s see Japan Economic Federation 1940). Yet the optimism of 1937/8 proved seriously misplaced, as the militarised economy relied increasingly on regulated banks and physical controls for allocating resources and restricted private profit,³⁷ government bonds overtook all other securities on the Tokyo Stock Exchange (Bassino and Segot 2015), while the Asia-Pacific tide of victory turned and Aikawa was unseated by the military in 1942. The Tokyo Stock Exchange remained defiantly open during the devastating carpet-bombing of Tokyo but closed shortly after Nagasaki. Many large investors were expropriated by the occupying force of US New Deal reformers. When the exchange re-opened in May 1949 its 549 listed companies were valued at a mere 4% of GDP, the *pre-Industrial Revolution* level of the west.³⁸

Japan's more extensive recourse to stock exchanges than Germany in the 1930s was facilitated by greater competition both among exchanges and from off-exchange trading. Berlin

³⁵ The stock price index (to the base January 1925=100, on the Bank of Japan website) had peaked in 1926 at 125, declined to barely half that in 1931, but peaked again at 140 in April 1937 and 127.5 in February 1938, before gradually declining.

³⁶ Rajan and Zingales' 1938 and Hamao et al's 1936 US ratios of 56-72% are for the NYSE alone (both using the NYSE Fact Book data), but on UK and US nationwide ratios of around 125% in 1939 see note 29 above.

³⁷ On wartime disruptions of capital and management, see Okazaki 1996.

³⁸ This was arguably excessively pessimistic, as the 1938 valuation was over-optimistic, and prices soon rose substantially.

(and, after World War Two, Frankfurt) dominated Germany's provincial exchanges and off-exchange public trading of unlisted securities was for long illegal. Competitive (and less regulated) Japanese exchanges encouraged trading by not charging listing fees. Japan's forty-six exchanges of 1898 fell to thirteen by 1911 (Tamaki 1995, p. 108) and to eleven by 1943,³⁹ when they were compulsorily amalgamated into the Japan Exchange (with a main exchange in Tokyo and ten branch exchanges, of which two soon closed). Outside these exchanges, unregulated OTC trading of both listed and unlisted stock long remained strong (trading listed and unlisted securities), so the precise size of the market is perhaps understated by the 1938 figure.⁴⁰ When nine exchanges reopened in 1949, they abolished forward trading in return for a ban on this OTC trading of listed stocks⁴¹ and (low) listing fees were introduced. By 1950, much of the post-war reorganization of stock corporations was complete. Paradoxically, Japan's quoted capital/GDP ratio reached a nadir at this time, when post-war Americanisation increased statutory investor protection, although within a few decades Japan restored its lead over Germany and achieved one of the most widely dispersed stock holdings in the world (Faccio and Lang 2002).

Corporate size distributions were highly skewed, so most Japanese KK capital at an early stage was in the small minority of companies that were quoted on exchanges,⁴² as was the norm in Europe, rather than (as in the United States before 1914 or the global norm today) most corporate

³⁹ Excluding the two stock exchanges in Manchukuo.

⁴⁰ The TSE formally listed only 157 companies (with 231 securities), but some 908 stocks were traded in its less regulated spot market (Japan Economic Federation 1940).

⁴¹ Before 1949, only forward trades had to be on exchanges in Japan; spot trades could be conducted anywhere, so the exchanges' share of this market was low. US-style margin trading was introduced in 1951 to stimulate demand.

⁴² In 1900, authorized capital listed on Tokyo alone was about a third of all KK capital (Hamao et al, 2009, p. 61, with precise data and definitions underlying the graph kindly provided by Tetsuji Okazaki; and Department of Finance 1902). Most firms were listed and traded elsewhere than Tokyo. Similar data for 1915–1937 suggests that the TSE's share of all KK capital remained around a third during World War I, peaked at 60% in 1922, and, after a sharp dip in 1923, remained above 50% from 1924 to the war. By 1949–1950, the corporate capital listed on all Japan's stock exchanges (by then all but a few percent quoted on Tokyo) again accounted for around one-third of the authorized capital in kaisha (compare the figures in Tokyo Stock Exchange 1939 with those in Bank of Japan, 1966, p.330).

capital being in close (unquoted) corporations. Apart from a tightening of the commercial code in 1911, which strengthened directors' liabilities for negligence, it is difficult to see significant early German-style positive impacts of corporate law in protecting shareholders in Japan. As we have seen, law and Nazi politics arguably shifted Germany from its strong initial (pre-1914) shareholder value culture to one that stunted stock exchange growth.

Why did Japan, with a commercial code loosely based on Germany's, develop so differently? Financial historians, noting the widespread development of stock exchanges before legal protections for investors were seriously implemented, have speculated that there were alternative mechanisms protecting shareholders, such as information signalling and monitoring by investment bankers, high dividend distribution disciplining boards, and private-order regulation of corporate charters by stock exchanges (such as anti-director rights or transparent accounts), which promoted shareholder confidence.⁴³ As far as I am aware, there is no study of whether interwar Japanese corporate charters voluntarily adopted good governance rules, though *kabushiki kaisha* were better at publishing accounts than American industrials had been historically. Okazaki et al. acknowledge that shareholders held ultimate control of corporate activities through the appointment and dismissal of directors at shareholder meetings, but argue that one of the reasons for the remarkable post-1918 growth of the Tokyo Stock Exchange, far from a strengthening of investor protection, was a relaxation of the rules, enabling the exchange to trade securities already traded on the outside spot market that had not applied for listing, thus improving market liquidity (Okazaki 1999, Hamao et al 2009). In some ways all Japanese exchanges seem much nearer to the Anglo-Saxon secondary exchange model of free-wheeling unregulated finance than to the regulated German bourse system. Yet that raises the same questions about their value to investors or corporations that remain

⁴³ Miwa and Ramseyer (2000, 2002) argue that, before 1914, Japanese quoted companies adopted good governance practices: they drained firms of excess cash by paying high dividends, tied managerial pay to firm profits, relied on reputational sanctions in the managerial labour market, restricted managerial discretion by charter and statute, and actively recruited prominent and reputed industrialists to their boards.

unresolved in the case of the US. Bassino and Segot (2015) argue that the Tokyo Exchange in the 1930s fails weak-form efficiency tests, noting its almost non-existent listing standards and insider dealing opportunities, and imply that post-war bank finance might have remedied such inefficiencies.

A more optimistic view of Japan's remarkable early growth in the quoted capital/GDP ratio is the voluntary emergence of gatekeepers and information signallers trusted by investors. Signalling by influential Meiji reformers such as Eiichi Shibusawa may have been an important supplement to legal regulation in Japan, and the zaibatsu may later have been an institutional substitute for weak legal investor protections.⁴⁴ It has been suggested that Chandler (1962) was wrong to claim the multi-divisional corporation efficiently monitoring subsidiaries was an American invention: Japan (Mitsubishi) - and Germany (Siemens) - independently pioneered such monitoring innovation before the First World War (Morikawa 1992, Kocka 1978). The strong development of Japanese stock exchanges in the interwar years is thus more easily seen as resulting from intense monitoring of professional managers by large investors (in some cases family zaibatsu) than of wide dispersion of holdings driven by strong legal investor protections.

It is, however, easy to over-rate the influence of zaibatsu. The average size of 389 Japanese companies quoted on Tokyo, Osaka, and some other exchanges in 1913 was, in dollar terms,⁴⁵ only \$3.2 million, compared with \$34.9 million for the 298 listed on the NYSE about the same time, \$4.8 million for the 910 listed on the Berlin Börse and \$14.1 million for the 1,198 listed

⁴⁴ Franks et al (2014) citing Okazaki's (2001) finding that zaibatsu enterprises had higher rates of return in 1922–1936. Okazaki interprets this as the result of family owners being more willing to employ professional managers than firms with dispersed shareholdings, a striking reversal of the Chandlerian orthodoxy, but in line with Morikawa and others on the zaibatsu. Fruin's view (1993, pp. 94–95) that Japan's stock exchanges were "small, underdeveloped in terms of the range and sophistication of financial instruments, and highly speculative" is difficult to sustain (except perhaps on their speculative nature), but was typical of American generalisations about varieties of capitalism at that time.

⁴⁵ At that time, \$1 = ¥2.

on the LSE.⁴⁶ This was partly because of Japan's low minimum listing size: paid-up capital of only ¥75,000 (\$37,500) had been required since 1894 (compared with \$250,000 on Berlin) and, even when this was raised for new listings for forward trades,⁴⁷ many small companies continued to be traded on the spot market. Furthermore, after railway nationalization in 1905, Japan (like Germany) lacked this large formerly quoted sector, which still dominated many other stock exchanges. The average corporate size in Japan will also be understated because neither the overall KK statistics nor the stock exchange statistics group corporate subsidiaries into zaibatsu holding company groups. The major zaibatsu were typically controlled by (unquoted) family partnerships, not KTs: nine zaibatsu controlled several hundred KTs with 15.1% of paid-up capital in 1937 (Hadley 1970 pp. 54–55),⁴⁸ and their dominance was then accentuated under wartime controls.⁴⁹ Although conglomerate groups had made up for the absence of finance in some areas, "spin-offs" creating independent subsidiaries were common in Japan (Suzuki 1991, p.94, Fruin 1993, Yonekura and Clahsen 1994). When Toyota Shokki (a loom manufacturer) entered automobile manufacturing in the 1930s, it soon separated its successful subsidiary as Toyota Cars. Some 98 percent of KTs with 85 percent of KK capital were not in major zaibatsu in 1937; these included most of Japan's fifty largest enterprises, many listed on stock exchanges, with shares more widely dispersed than closely-held zaibatsu subsidiaries. Did other block-holders or bankers provide investor protections and monitoring where listing rules, laws or zaibatsu did not? As in the US (for non-NYSE securities), the historical evidence for this is inadequately explored.

⁴⁶ Firm size distributions are highly skewed, tending toward the lognormal, so the reported sizes are sensitive to the cut-off points implied by different numbers of listed firms averaged, see Hannah and Kasuya (2016).

⁴⁷ By the 1930s the minimum paid-up capital for listing was ¥2m.

⁴⁸ Her data are from the post-war Holding Company Dissolution Committee, using Takahashi and Aoyama's 1937 definition of zaibatsu, which is wider than the one modern scholars favour. Morck and Nakamura say that the "big 8" had 449 subsidiaries in 1937 (and the "big 10" 1,200 in 1945).

⁴⁹ Hadley (1970, p. 49) gives a figure of 35.2% of KK capital for ten zaibatsu in 1945, but both wartime distortions and larger disagreements among ministries on the size of the denominator make this less reliable than earlier indicators.

It was post-1945 Americanisation that placed stronger investor protections on the Japanese statute book, but the occupying authorities also dissolved the zaibatsu and expropriated large shareholders. If this caused a loss of valuable signalling and/or monitoring, it provides a neatly compatible explanation of the initially lower post-war penetration of Japanese stock exchanges. The later recovery may have been caused as much by alternative institutional innovations by main banks and keiretsu as by formal investor protections (Franks et al 2014, Morck and Nakamura 2007, Bassino and Segot 2015). Both Germany and Japan experienced some financial repression and greater reliance on government-controlled or -influenced bank financing in the war and post-war decades. Japan experienced higher level of expropriations of families that Allied occupiers considered compromised; Japan also relied more on banks than Germany until its banking troubles of the 1990s. Germany recovered from the war faster and for a time its ratio of equity capitalisation was higher than Japan's. However, from the 1970s the Japanese lead over Germany in the capitalisation/GDP ratio re-emerged: by 1999 the German ratio was still only 67% compared with Japan's 95%. They were thus nearer together than in 1938, though both were now markedly behind "Anglo-Saxon" levels (Australia 113%, Canada 122%, US 152%, UK 225%, see Rajan and Zingales 2003). However, in the later 1980s investors in the Japanese market had demonstrated continued capacity for over-optimism – again, as in 1938, not paralleled abroad - though for quite different reasons.⁵⁰

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Did any of this complex, and sometimes rapidly changing, story matter? After all, these economies by the early 21st century looked very similar to each other, despite their varied historical financial trajectories. The US may have lagged European markets on some dimensions before 1914, yet, in an economy with abundant natural resources, extensive immigration and avoiding Europe's

⁵⁰ In 1990 Japan's market capitalisation was (absurdly) 60% of the world's; that excessive valuation preceded a long decline.

descent into economically suicidal wars, revolutions, inflation and other political disorders, US equity returns in the twentieth century generally exceeded Europe's (Dimson et al 2002). One way or another, capital flowed to more productive uses in all advanced capitalist economies, so it is easy to dismiss differentiation in securities markets as arcane detail and insist with Joan Robinson (1952) that "where enterprise leads, finance follows." One modern study, examining the relation between financial indicators and growth outcomes in 47 countries in 1976-93 - a period of increased globalization not dissimilar to the pre-1914 period - found that domestic stock market size was then "not robustly linked with growth, capital accumulation, and productivity improvements" (Levine and Zervos 1998). Unlike historians who claim positive relationships in the nineteenth century, using very limited time series and cross-section evidence, they control for factors such as initial incomes and the anticipatory nature of stock prices. Perhaps Joan Robinson was right?

If Germany was handicapped relative to the US and UK by having smaller capital markets (beyond its core well-regulated Berlin equities) and by outlawing informal markets which accounted for many start-ups and quoted securities in America, Britain and Japan, its performance suggests it was not handicapped very much. It had the world's largest reinsurance industry and best research universities before 1914, so was hardly bereft of alternative sources of risk-sharing and technical innovation. The large German market for government bonds and mortgage-backed *Pfandbriefe* provided both ample liquidity for investors and adequate financing for railways and other utilities that were alternatively funded by capitalist corporations in the US. However, German promoters could not raise funds from public investors for start-ups: IPOs of firms with no track record were banned on all German exchanges, though in the US only by the NYSE (its private order rules for listings normally required a run of accounts). Yet capital for new ventures financed by US secondary markets (Jones & Baker 1919, White 2013, Nicholas 2016) was alternatively provided in Germany around 1900 by the state (as in the Reich postal service's development of telephones), by existing listed corporations (as with AEG/Siemens' joint financing of Telefunken in radio), by rich individuals (Continente Viskose, a pioneer rayon manufacturer, was financed by Germany's second richest

man, Prince Guido Henckel von Donnersmarck) or by universal banks aiming eventually to float them as more mature enterprises (as with Deutsche Bank's nurturing of Deutsche Petroleum). It is arguable that stewardship by such experienced "visible" hands was more informed and empowered than that of speculative investors guided by the "invisible" (and, to some critics, blind) hands of secondary Anglo-Saxon stock markets, then providing these services to US enterprises in a manner akin to modern venture capitalists. One of the reasons capitalism has been so successful is not that it always favours the invisible over the visible hand, but that it permits more productive and disciplined experimentation in hybrid collaborations between the two than state-directed central planning.

However, it is not obvious that the German way had superior outcomes, for the direct US counterparts of these four companies generally grew faster (though not necessarily for financial reasons⁵¹). The equivalents were American Bell (funded by a consortium which initially traded the shares informally in Boston), American Marconi and American Viscose (high-tech start-ups initially funded by IPOs in London, and later transferred under political pressure to US stockholders) and Gulf Oil (a 1901 start-up nurtured off-exchange in Pittsburgh). Historical financial repression, moreover, seems to have had persistent – and possibly path-dependent - effects. Germany today has a surprisingly small venture capital industry compared with the more free-wheeling financial centres of the US and UK and, despite its interwar flirtation with stock exchanges of "Anglo-Saxon" extent, and so does Japan (Maslakovic 2012). That may - or may not - change as much in the future as it has in the past. These countries' histories of financial development - sometimes diverging from

⁵¹ The US had *non-financial* advantages like natural resources and high immigration levels, while the UK, like Germany lacking those advantages, shared the US's acceptance of more liberal financial markets. UK equivalents – National Telephone (before it was taken over by the Post office in 1912), Marconi Wireless Telegraph, Courtaulds and Shell – also grew to be larger than German private sector comparators in these four industries. However, as the comparative literature more prominently emphasises, Germany's pre-1914 performance in electrical manufactures was well ahead of the UK's and in fine chemicals well ahead of both the US and UK. Yet educational, technical or regulatory causes are more commonly discerned than *financial* ones for German precocity in electricals and fine chemicals.

conventional national characterisations - also suggest that we have choices and are not entirely prisoners of path-dependent historical processes.

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