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Randall Morck
Berenard Yeung

Center for Economic Institutions

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Institute of Economic Research
Hitotsubashi University
2-1 Naka, Kunitachi, Tokyo, 186-8603 JAPAN
Tel: +81-42-580-8405
Fax: +81-42-580-8333
e-mail: cei-info@ier.hit-u.ac.jp

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Randall Morck

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1. Introduction

The Japanese economy, after spectacular performance in the decades following World War II, has been surprisingly weak now for more than a decade. Figure 1 shows this remarkable contrast. From 1961 to 1989, Japan's Gross Domestic Product (GDP) averaged a remarkable 6.37% annual growth rate. From then on, Japan's GDP has posted only a 1.67% average growth rate.

Something substantial clearly happened to the Japanese economy at the end of the 1980s. Certainly, the Japanese stock market and real estate market both collapsed spectacularly. But financial and real estate markets have collapsed before many times and in many countries, and the results are not always a decade of economic stagnation. Indeed, the US economy scarcely noticed the stock market collapses of 1907 and 1987. Why is the Japanese financial disarray of the late 1980s so difficult to transcend?

Our key point is that Japanese economic institutions were well suited to both post war reconstruction and "catching up" with other advanced economies, but not to surpassing them. We argue that Japan's "catch up" was essentially complete by the late 1980s. The business-government cooperation and bank-centered corporate governance that served Japan well for decades are now ill-suited in critical ways to guiding Japan further forward. Yet these institutions continue with an inertia that reduces Japan's ability to find and invest in new economic opportunities, including new enterprises.

In particular, we argue that a shift away from state and bank oversight and towards greater reliance on equity markets to allocate capital is desirable for Japan. However, such a shift is not feasible unless certain key institutional changes are made. These include the dismantling of intercorporate equity holdings, more transparent corporate decision-making, and corporate governance that is more responsive to shareholder pressure. Finally, we are skeptical of arguments that such changes run counter to deep Japanese cultural traditions, and are therefore optimistic that they can be accomplished.

2. The Remarkable Triumph of the Japanese Economy

Economic growth is a complicated phenomenon, and Japan's economic history since the Meiji Restoration suggests that Japanese know more about achieving and sustaining economic growth than most others. This is clearly true. Japan's political, financial, and business leaders have presided over what is probably the greatest "rags to riches" story in the history of the world. Japan in 1878 was an impoverished and backwards feudal country, little different from the most backward regions in the world in terms of the standard of living it provided for its people. Japan in 2001 is one of the richest countries in the world, having accomplished in little more than a century what took many times longer for the United Kingdom, the United States, and other Western

economies. Even Germany, though also late to industrialization, started from a higher base when Bismarck orchestrated its economic advancement in the late 19th century.

Economists from other countries should therefore speak cautiously when advising Japan about her economic policy. This analysis of the current economic situation of Japan is offered in this spirit, as a way of thinking that might perhaps be useful, but that Japanese policy makers and business leaders surely will take or leave as they see fit.

In our view, Japan's very success is the key to understanding the prolonged economic discord that began in the late 1980s. Figure 2 graphs the difference between Japan's per capita GDP, measured at purchasing power parity in current US dollars, and the average per capita GDP of other leading free market economies (the other six G7 countries less Germany), measured in the same way.[1] Although Japan began the process of industrialization in the late 19th century, its economic development lagged that of the leading Western countries until 1989. In the early 1970s, Japan's per capita GDP was $5,960 versus $8,190 for the U.S. and some $2,000 below the average for the leading Western Countries. In short, 1989 is the year when the Japanese economy unambiguously and indisputably "caught up" with the West.

We argue economic growth requires different institutions depending on an economy's scope to grow by applying existing knowledge. When an economy has great potential to grow by applying techniques and technology developed elsewhere, its main constraint is the availability of capital. Consequently, institutions that promote investment and channel it into capital spending are needed. Since many countries have passed through this phase of economic growth, many institutional arrangements exist for accomplishing this. In contrast, when an economy has exhausted the potential of existing practices and technology, it can only grow further by devising new and superior practices or technology. At this stage, the economy's growth is constrained by its stock of knowledge. Consequently, institutions that facilitate the rapid development and application of new technology and practices are needed. The range of institutions that are known to promote this sort of growth (creative destruction) is much more limited.

Different companies in Japan have employed each method of growth with considerable success. For example, Japan's great *zaibatsu* families built their prewar corporate empires largely by applying technology developed elsewhere in Japan. But Sony, one of Japan's great technology leaders, has built its fortune by developing new technology, especially in the filed of miniaturization. Because of this, we argue that the seeds of a creative destruction-based economy exist in Japan.

3. The Growth of Businesses

In free enterprise economies like Japan, national economic growth depends on the growth of private sector businesses – including listed corporations, private corporations, partnerships, private cooperatives, etc. Therefore, to understand the nature of economic growth, we must begin with corporate growth, which includes both the growth of existing companies and the creation of new companies. This section presents a simplified analysis of how corporations decide whether or not to grow that captures the essence of

[1] The G7 countries are Canada, France, Germany, Japan, Italy, the United States, and the United Kingdom. We drop Germany because, like Japan, it had to rebuild its economy after the war and because the unification of East and West Germany affects German data during this period. Data are from the World Bank.

what is taught in most business schools. The same techniques are used to assess the viability of new businesses seeking financial backing. In doing this, we are not departing from traditional macro economic thinking. We are merely going back to its root: macroeconomic performance is the sum of microeconomic performance.

Moreover, King and Levine (1993) and a huge subsequent literature confirm that the sophistication of a country's financial system is closely correlated with macroeconomic performance. La Porta *et al.* (1997, 1998, 1999), Morck *et al.* (1998), and others also show that traditional financial management concern like corporate governance laws and the standing of investors in court also matter to macroeconomic performance. Consequently it is useful to connect standard ways of thinking about corporate finance issues to macroeconomics. This is the conceptual objective of this section.

Two caveats are in order before we proceed further.

First, in a real economy, not all growth is generated by private sector businesses. Government, state-owned enterprises, and not-for-profit enterprises account for a large fraction of GDP in many advanced economies, and Japan is no exception. The objectives that direct the growth of these enterprises may differ substantially from the economic profit-seeking behavior that governs corporate growth. However, the role of private sector businesses is arguably more fundamental. Government organs and public sector enterprises exist because the private sector generates the tax revenue that let them survive without concern for economic profits. Non-profit enterprises exist because of donations from businesses, governments, and individuals. Personal incomes derive either from employment in the private sector or from employment by government, public sector enterprises, or non-profits. The ultimate source of these funds is therefore also private sector businesses.

Second, it is well-known that all businesses do not follow the economic profit-seeking behavior mandated by corporate finance theory. This is because the individuals who run businesses are wont to maximize their own utility, not economic profits, which accrue to others, such as the shareholders who legally own the firm. Because this situation involves a breakdown in the duty of legal agents (managers) to act for the firm's owners or principals (shareholders), it is called an *agency problem*. An important consideration in designing economic institutions is their ability to constrain agency problems. We shall return to this issue later in the paper.

3.1 The Corporate Finance Foundations of Macroeconomics

An economy's gross national product is by definition the sum of its firms' revenue minus outsourcing purchases, that is, its firms' total value added, which is the compensation to workers and to capital owner.

[1] $$Y_t = \sum_j (R_{j,t} - P_{j,t})$$

where Y_t = GNP,
$R_{j,t}$ = firm j's revenue in period t
$P_{j,t}$ = firm j's outside purchase

With offsets in the purchases of intermediate inputs (which = other firms' value added), Y_t is the economy's total value added, i.e., its total labor earnings and capital earnings, which can be broken into two components: normal capital returns and economic profits.

Conceptually, we can write

[2] $$(R_{j,t} - P_{j,t}) = w_{j,t}L_{j,t} + r_{j,t}K_{j,t} + \pi_{j,t}$$

Here, $w_{j,t}L_{j,t}$ is labor cost, $r_{j,t}K_{j,t}$ is the rental price of capital, and $\pi_{j,t}$ is firm j's economic profits in period t.

When a business considers undertaking a new project i (expanding), it calculates the *net present value* (NPV) of doing so as

[3] $$NPV_{ijt} = \sum_{s=t+1}^{T} \frac{\mathbf{E}\left[f_{ijs}\middle|\Psi_t\right]}{(1+r_t)^{s-t}} - K_{ijt}$$

where the discount rate, r_t, is the cost of capital in period t; $f_{i,j,t}$ is the increased net cash flow investment project i will generate for firm j in future period s; K_{ijt} is the capital spending needed in period t to finance project i, $\mathbf{E}$ is the expectations operator and Ψ_t is the information set known at time t to the decision maker. We assume that all investment projects are paid for in one period and provide returns in the form of increased cash flows in subsequent periods. Note that

[4] $$f_{ijt} = R_{ijt} - P_{ijt} - w_{ijt}L_{ijt}.$$

To connect standard corporate finance models to standard economics models, we can take the additional cash flows from firm j setting up project i in period t to be a constant perpetuity, f_{ij}, beginning in period $t + 1$. Consequently, we can write

[5] $$NPV_{ijt} = \frac{E\left[f_{ij}\middle|\Psi_t\right]}{r_t} - K_{ijt}$$

The firm's expected economic profit in each subsequent period is then exactly

[6] $$\mathbf{E}\left[\pi_{ijt}\middle|\Psi_t\right] = \mathbf{E}\left[f_{ij}\middle|\Psi_t\right] - r_t K_{ijt}$$

and is positive (negative) if the marginal revenue from the new project, f_{ij}, exceeds (is less than) the marginal cost of the current capital expenditure, $r_t K_{ijt}$. This simplification is not necessary to our argument, but perhaps does connect it to standard microeconomics more clearly.

In standard corporate finance theory, each firm j is assumed to confront a declining *investment opportunity schedule*, of the sort illustrated in Figure 3, so that for each successive project i costing K_{jit}, the additional perpetual subsequent cash flow f_{ij} is smaller. Economic efficiency means the firm should invest in all projects that have positive NPVs (positive economic profits in the perpetuity simplification) and then stop.

If we take the cost of capital, r_t, as constant, and the level of technology and other relevant features of the economy as fixed, all firms come to a steady state where $\mathbf{E}\left[f_{ij}\middle|\Psi_t\right]-rK_{ijt}=0$.

We can rewrite this as

$$[7] \qquad q_{jt} \equiv \frac{1}{K_{ijt}}\left(\frac{\mathbf{E}\left[f_{ij}\middle|\hat{\Psi}_t\right]}{r}\right)=1$$

for project i the marginal capital investment firm j undertakes. That is, q_{jt} is the marginal Tobin's q ratio of firm j at time t, for $\frac{\mathbf{E}\left[f_{ij}\middle|\hat{\Psi}_t\right]}{r}$ is the market value investors in financial markets, using the information set $\hat{\Psi}_t$ available to them, assign to the marginal investment project; while K_{ijt} is that project's replacement cost.

Economic efficiency means that firms should undertake further investment projects as long as their marginal q ratios exceed one, and stop investing when their marginal q ratios fall to one. Note that this works only if $\Psi_t=\hat{\Psi}_t$; that is, if the information available to investors is the same as the information available to investors.

3.2 Implications

Several messages follow from this simple algebraic restatement of economic identities:

(i) Corporate growth is treated as a *disequilibrium phenomenon* in standard corporate finance classes at business schools throughout the world. This is because NPVs are positive only where economic profits (quasirents) are positive, and corporations are not supposed to undertake additional capital investment unless the NPV of doing so is positive.

(ii) Poor corporate governance leads firms to stop either too soon or too late along their *investment opportunity schedules*. This causes the macroeconomy's total output to be suboptimal.

(iii) Firms *investment opportunity schedules* are usually taken as given, or as shifting due to exogenous factors. For example, an exogenous technological breakthrough (an exogenous increase in the information set Ψ_t to $\Psi_{t+1} > \Psi_t$) shifts a firm's upwards, stimulating investment and growth. So does an exogenous surge in demand for the firm's products.

(iv) In the absence of an exogenous technological breakthrough, corporate growth must come from investment in knowledge at a rate that is compatible with the expected cash flows newly created knowledge can generate. That is, $\Psi_{t+1} = g(R\&D,\Psi_t)$ This is the gist of Schumpeter's (1912) theory of creative

destruction as the engine of growth in a free enterprise economy, as modeled by Romer (1986) and others.

4. Exogenous Technological Change and "Catch Up" Growth

Technological change in the western world has primarily been embodied in capital. Because of this, any emerging market economy that seeks to grow by absorbing knowledge developed in other economies requires considerable capital accumulation.

We incorporate *knowledge* into our model be denoting the level of knowledge available by Ψ_t. We use the term *knowledge* to mean not just scientific and engineering knowledge, but managerial know-how, marketing ability, and all the other types of knowledge that contribute to economic prosperity in developed economies.

4.1 The Nature of "Catch Up" Growth

"Catch up" growth comes about when knowledge from outside the economy becomes available, increasing Ψ_t by $\Delta\Psi_t$. A discrete increase in Ψ_t causes an across the board increase in the additional cash flows the company can achieve from its whole investment opportunity schedule of possible expansion projects.[2] That is, $\frac{\Delta}{\Delta\Psi_t}\left(\frac{\mathbf{E}\left[f_{ij}\middle|\Psi_t\right]}{K_{ijt}}\right) > 0$ for all investment projects i that firm j might undertake in period t.

This raises the NPVs of a generic capital investment project to

$$[8] \qquad NPV_{ijt} = \frac{\mathbf{E}\left[f_{ij}\middle|\Psi_t + \Delta\Psi_t\right]}{r_t} - K_{ijt} >> 0$$

and firms consequently acquire new capital goods to grow because projects that were not economically sound in the past now make sense. Positive NPVs abound, and pure economic profits or *quasirents* $\pi_{ijt} = f_{ij} - r_t K_{ijt} >> 0$ are expected to be plenteous for those with access to capital.

4.2 Who Gets the Quasirents of Economic Growth?

Corporate finance theory posits that shareholders are residual claimants of the firm's economic profits. Economic profits may indeed accrue to shareholders. But they could also flow to creditors, managers, workers, or the state. Their precise ultimate disposition probably depends on complicated bargaining models that are beyond the scope of this study.

Certainly, top corporate executives did well as Japan caught up. Despite their relatively low base salaries, the top executives of Japan's greatest corporations presided over "entertainment spending" budgets. Morck and Nakamura (1999) report that the

[2] An alternative definition of increased knowledge is the replacement of the firm's old investment opportunity schedule of cash flow perpetuities generated by possible investment projects with a new schedule. Some of the firm's old projects might then become unviable as new projects become viable. This situation would require us to consider disinvestment and downsizing for some firms, and is clearly a more realistic definition of technological development. However, for the moment, we restrict ourselves to this more limited definition.

entertainment expenses of Japanese firms totaled ¥6.14 in 1991. In comparison, total R&D spending that year was ¥9.74 trillion. Some students of Japanese business stress the importance of networking and view entertainment costs as a prudent investment. We are skeptical of this interpretation, and are unaware of any hard evidence to back it up. It seems more plausible to interpret corporate entertainment spending as consumption by top executives.

The employees of Japan's largest firms also did well, with job security far in excess of that available to their North American peers.

Politicians and powerful lobby groups, like farmers, probably ended up with large portions of these economic profits too. Certainly, in countries earlier along the path of catch up growth, such as the Philippines and Indonesia, Marcos and Suharto relatives appear to have served as quasirent sinks.

In Japan, banks probably also captured substantional quasirents. Caves and Uekusa (1976) show that main banks charge their client firms higher than market interest rates. For keiretsu firms, this premium is proportional to dependence on group financial institutions. Yet Nakatani (1984) shows keiretsu firms to be more levered than independent firms. Aoki (1988) describes these high debt costs as an agency fee paid by individual shareholders [for bank monitoring]. However, Morck and Nakamura (1999) find no evidence that bank monitoring benefits shareholders, and Morck *et al.* (2000) find evidence of a negative effect on share value for most Japanese firms.

Japanese banks may also have organized transfers of these quasirents between companies. Hoshi et al. (1990) and Morck and Nakamura (1999) argue that banks also orchestrated transfers from profitable firms to firms in financial distress. Hoshi et al. emphasize the positive aspects of this inter-corporate insurance. Morck and Nakamura argue that these transfers amounted to economically suspect bail outs of poorly governed firms closely associated with bank keiretsu groups, and had little stabilizing effect on other firms. They argue instead that these transferred quasirents served to obfuscate corporate governance problems in the firms that received them.

4.2 Economic Institutions for Catch-Up Growth

Note that $\mathbf{E}\left[\pi_{ijt}\middle|\Psi_t\right]=\mathbf{E}\left[f_{ij}\middle|\Psi_t\right]-r_tK_{ijt} >> 0$, so firms need only raise new capital at the historic cost *r*, or at a cost not greatly higher, to expand profitably and capture the readily available streams of quasirents $\{\pi_{ijt}\}$. Access to large quantities of cheap capital is critical, so the economic institutions necessary to support "catch up" growth are those that facilitate a high savings rate and ready financing for business expansion.

Corporate governance, or the quality of the individual capital budgeting decisions, is only of secondary importance, for the abundant quasirents make virtually any expansion profitable. The future cash flows project *i* will produce for firm *j* in period *t* are estimated with an error π_{ijt}, so $\pi_{ijt} = f_{ij} - r_tK_{ijt} + \eta_{ijt}$.

First, who runs the company is unimportant because keeping π_{ijt} from being too large easy. The technology and business practices needed are known, and must only be replicated. Practical problems in setting up the productive facilities needed have been solved elsewhere. Selling the products is straightforward, as their usefulness has been demonstrated in other countries.

Second, who makes the decision matter little because $\mathbf{E}\left[\pi_{ijt}|\Psi_t\right] = \mathbf{E}\left[f_{ij}|\Psi_t\right] - r_t K_{ijt}$ >> 0. Even a big error in π_{ijt} still leaves $\pi_{ijt} = f_{ij} - r_t K_{ijt} + \eta_{ijt} >> 0$ most of the time.

Third, the appropriation of cash flows by management or other parties can be quite large, biasing π_{ijt} deep into negative values, yet π_{ijt} can remain well above zero.

Because of these factors, firm-level corporate governance is unimportant as long as huge errors and gross theft by corporate insiders are avoided. Brilliant managers are unnecessary. Any reasonably honest person can do a workmanlike job as a corporate decision-maker, and the firm can capture at least some of the quasirents that are there for the taking.

This wide leeway is probably why different countries have successfully used very different corporate governance systems while "catching up". Bismarck encouraged large banks to take an active role in developing Germany. Malaysia's government entrusts its corporate assets to politically anointed corporate executives to fulfill carefully balanced racial representation objectives. Japan entrusted its economic development to powerful families in the prewar period, and to bankers and MITI bureaucrats in the postwar period. Great Britain absorbed foreign, primarily Dutch, technology and business practices after the Glorious Revolution, and used a stock market to allocate capital. United States businesses relied heavily on various banking regimes, the stock market, preferred equity, and traded bonds as that country caught up with Britain during the 19th century.

This kaleidoscope of institutions suggests that anything able to bring about the rapid accumulation of capital can support catch-up growth. Japan's banks and MITI industrial policies worked as well as any other alternative – and perhaps better than many. They were probably helped along by Japan's policies of keeping saving within the country and in the banking system by banning corporate bonds. The result was a large flow of capital channeled towards corporations at an artificially low cost.

5. Approaching the Knowledge Frontier

Once an economy has absorbed all the readily available knowledge other economies can provide, further "catch up" growth due to the exogenous arrival of new knowledge is not possible. The individual firms in other countries that develop new products and new processes keep these competitive edges secret, and intellectual property laws protect their rights to do so. " Catch up" growth would only become possible again if the country stagnated for a decade or two while other economies generated new knowledge, and then caught up again.

Having reached the frontiers of knowledge, firms must prudently expend resources on research and development, market research, advertising, and the like, so as to increase Ψ_t themselves. Further growth that involves simply raising capital and investing it in more projects using current technology causes the firms to move too far out along their investment opportunity schedules, and to undertake projects with negative net present values. That is, firms undertake an increasing number of projects with $f_{ij} < r_t K_{ijt}$ and so with $\pi_{ijt} < 0$.

As the returns to further expansion grow ever more meager, strains appear in the country's economic institutions. Are some of these systems better than others at dealing with these strains?

5.1 Concentrated Banking and the Exploitation of Cheap Capital

When a country has applied almost all the exogenously available additional knowledge, $\mathbf{E}\left[\pi_{ijt}\middle|\Psi_t+\Delta\Psi_t\right]=\mathbf{E}\left[f_{ij}\middle|\Psi_t+\Delta\Psi_t\right]-r_tK_{ijt}\to 0$. If the future is estimated with a large error π_{ijt}, the firm can increasingly often end up with economic profits $\pi_{ijt}=f_{ij}-r_tK_{ijt}+\eta_{ijt}<0$. The quality of the individual capital budgeting decisions starts to matter more, for quasirents are now less juicy. The appropriation of cash flows by management or other parties can, biasing π_{ijt} so that $\mathbf{E}\left[\eta_{ijt}\middle|\Psi_t\right]<0$, is increasingly likely to leave π_{ijt} below zero.

One solution is to improve corporate decision-making and to find ways to expand the set of available knowledge further. But this requires major changes in the way firms are run. Is there a simpler solution?

Japan and other East Asian countries have relied heavily on a concentrated banking industry to oversee their "catch up" growth, and both grew quite quickly. This may not be a coincidence. If firms' increase in demand for capital pushes up the cost of capital, r_t, this would lower the present value of the additional cash flow the new technology makes possible and stops the firm's expansion more sharply than if r_t did not rise. Taking this line of argument further, if r_t can be pushed to an artificially low level, $\pi_{ijt}=f_{ij}-r_tK_{ijt}+\eta_{ijt}$ can rise above zero, even if it would be negative at freely set cost of capital.

This observation may explain the seemingly inordinate importance many Asian economies, including Japan, have put on keeping interest rates low while at the same time encouraging high savings rates. Cheap and abundant capital extends the life expectancy of profitable "catch up" growth.

Indeed, a quasi-monopolistic banking system that keeps interest rates low might be quite useful to those in charge of a country's existing large firms in the final stages of "catch up" growth. Bismarck is thought to have initially sanctioned deposit rate price fixing by banks to keep down the cost of capital for politically powerful *Junker* feudal landowners, who regularly borrowed and repaid funds over the agricultural cycle of planting and harvesting. However, the German banking system proved extremely resistant to change over subsequent decades - and in the postwar reconstruction decades. Perhaps political lobbying by those in charge of Germany's existing large firms played a role in this. Concern about agricultural lending also contributed political support to capping interest rates in the US in the 1930s. These *Regulation Q* caps may have made post-depression reconstruction, a sort of "catch up growth" in which the civilian economy absorbed military technology such as jets and synthetic fabrics, economically viable for a longer period of time after World War II than would have been the case were interest rates in that country free to rise.

Figure 4 shows that Japan's real interest rates were comparable to those of the United States until 1976 (with the exception of a downward spike in Japanese real rates in the early 1970s due to a spurt of high inflation). However, after 1976, Japanese interest rates have generally been one to two percentage points below US rates. Note also that Japanese *per capita* GDP growth dropped in the early 1970s – from the eight to ten percent range of the previous decade to the three to five percent range that persisted until the late 1980s.

The approaching end of catch up growth must have been apparent to Japanese top corporate executives and government officials some years in advance. Perhaps strains to the viability of "catch up" growth, in the form of ever more marginal NPVs, began to show in Japan in the mid 1970s. Government and corporate leaders may have found depressed interest rates an effective macroeconomic stimulus because this prolonged the economic viability of Catch up growth. The cost of this was that firms moved further out on their investment opportunity schedules than would have been economically feasible had Japanese firms faced global market costs of capital.

This renewed growth lasted to the late 1980s, when Japan's economy settled into its current doldrums. This ultimate slow down should not have been unexpected, for low interest rates do not cure the problems associated with approaching the technological frontier, but only delay the critical adjustments by prolonging the economic viability of "catch up" economics. By the late 1980s, Japan had unambiguously reached the technological frontier, and Japanese firms had moved beyond the efficient points of their investment opportunity schedules. Interest rate price fixing could no longer help, and banks were left stretched by what, in retrospect, seemed excessively generous granting of credit.

5.2 A Bubbly Toast to Success

Interestingly, Japan's real estate and stock market bubbles also occurred as Japan's economy approached the global technological frontier. Perhaps bankers and corporate executives began to find further unprofitable investment in plant and equipment increasingly hard to justify, and so sought alternative investments for the funds they could still obtain so cheaply from Japan's great banks. Stocks and real estate are obvious places to invest money while waiting for other opportunities to appear, and this doubtless occurred to many people simultaneously. The result of this increased demand for stocks and real estate was to push stock and real estate prices higher, which served to justify the wisdom of those who invested in these assets and to attract further investment funds

Kindleberger (1978) proposes that financial crises typically follow periods of abundant quasirents.[3] These periods of abundant quasirents are created by economic "displacements", such as the beginnings of wars, armistices, revolutions, the erection of trade barriers, the lowering of trade barriers, free trade, crop failures, extraordinarily abundant crops, and virtually any other sudden large change that leaves the economy in a profound disequilibrium. Kindelberger mentions radically new technology as a common source of such economic displacement.

Certainly, the inflow of foreign technology into Japan on a vast scale over the past century and a quarter must have had profound effects of this sort. Of course, Japan's economy did not steadily absorb this technology in a continuous prosperity. Political factors, wars, trade barriers, and wrenching institutional changes associated with post-war reconstruction were all important, and Japan experienced recessions, depressions, and asset price fluctuations like any other country. However, the potential for earning economic profits by further developing Japan along the lines of the richest Western economies was never in serious doubt.

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[3] Kindelberger attributes this model to Minsky (1972), who attributes it to Keynes (1933). The statement of it by Kindelberger is the clearest statement, and is also the most carefully supported with historical documentation.

According to Kindelberger, These profound disequilibria create abundant quasirents; and those who capture these quasirents become very rich very quickly. These high returns create a financial and monetary expansion, often in the form of vastly increased bank credit, and a general expectation of very high returns. These general expectations may be legitimate for a time, as the economy adjusts to the new equilibrium, but they are not rational in the longer run.

That irrationally high expected returns become pervasive is, however, is consistent with recent work in behavioral finance, summarized in Shleifer (2000), showing that people give excessive weight to recent experience in performing Baysian-style updates of their expectations. In the case of Japan, better than a century of catch-up economic growth convinced business and government decision-makers to expect an abundance of profit opportunities as long as basic criteria of monetary stability, capital availability, and institutional predictability were satisfied.

When quaisrents become scarce as the necessary economic adjustments near completion, the now overextended financial system and irrationally high expected returns give rise to what Kindelberger calls *overtrading*. Overtrading is the bidding up of asset prices caused by a continued search for high returns that can no longer be justified by the real economy. Overtrading engenders speculative bubbles - expectations of high capital gains - that, for a time, are self-fulfilling.

This period of overtrading eventually creates fertile ground for confidence artists. When genuine high real return investments begin to dry up, swindlers join the fray, promising high returns that no investor would have taken seriously under normal circumstances, but that now seem plausible to investors, given their excessively optimistic expectations. Ponzi schemes and other financial chicanery abound.

Eventually, though, as more and more money seeking high returns pushes asset prices rise to increasingly dizzy heights, the disconnect of asset prices from the real economy becomes obvious. Also, the inevitable exposure of frauds and swindles undermines investor confidence and triggers a reappraisal of expected returns and asset prices back to levels consistent with realistic long-term economic growth.

Since much of the overtrading in genuine assets and investment in swindles of various sorts was financed with credit, Kindelberger argues that a stock market collapse, banking crisis, or the like, often follows. If the financial system and the country's corporate sector are unable to regroup and reinitiate normal economic growth, a prolonged economic crisis can also ensue. If the real economy is able to carry on unscathed, the financial crisis passes quickly.

Kindelberger (1978) establishes the general validity of this model with a detailed historical account of financial crises. He investigates every significant economic and financial crisis in European and American economic history, and fits all of them to this pattern.

We argue that the economic crisis that beset Japan at the end of the 1980s is an example of this process. Japan's current problems follow a bout of overtrading, a classical bubble of the sort Kindelberger describes, and a financial crisis of the sort he argues typically follows. However, Japan's situation is not a typical case like the dozens of others Kindelberger reviews. Japan cannot simply regroup its financial system and continue as before because Japan has now caught up – fully, completely, and finally. Further economic growth must now be qualitatively different, and requires different

institutions. Hence, the lingering and apparently intractable nature of Japan's economic doldrums.

6. Transcending the Knowledge Frontier

As figure 1 shows, Japan's *per capita* GDP surpassed the average for other rich countries in 1989, cleanly marking the end of "catch up" growth. This transition means that further growth by replicating existing property, plant and equipment will not generate positive economic profits. Further growth instead requires investment in new technology, new products, new processes, and other innovations that can generate growth by creative destruction, which is the process that is believed to fuel continuing economic growth in the advanced industrial economies.

6.1 Growth by Creative Destruction Replaces Growth by Capital Accumulation

Creative destruction was identified as playing this role by Schumpeter (1912). Entrepreneurs create innovations such as new products or production processes. Since these innovations are not known to others, the entrepreneur has a monopoly on their use, and this monopoly generates economic profits for the entrepreneur and thus allows for the growth of his business. Indeed, the maximum social return to his innovation is achieved if his firm grows as rapidly as possible, for Marshall (1890), Jacobs (1985), Romer (1986), Porter (1990) and others argue that innovations typically have increasing returns to scale. The return to the innovation is therefore largest if it is applied on the largest scale feasible.

Schumpeter (1912) argues that new firms are often required as vehicles through which innovations can be generally applied across the economy. This is because those in charge of established firms have a vested interest in preserving the value of the (old) capital goods their firms own. Innovations often make past investments in property, plant, and equipment obsolete. Schumpeter chose the term *creative destruction* to encapsulate this destruction of the value of old capital goods by innovators' creativity.

Schumpeter (1942), apparently influenced by the Great Depression and the apparent success of Soviet Communism and German National Socialism in the 1930s, qualified his earlier views somewhat, and argued that large established oligopolistic or monopolistic firms might instead be the best vehicles for generating and applying innovations. This is because their monopoly profits can be used to fund innovation R&D while preserving corporate cultures and other intangible assets associated with the survival of the corporate entity.

In all likelihood, both versions of creative destruction have some validity. Acs *et al.* (1997) argue that each has advantages and disadvantages. Innovation in large firms is held back because employees know that the benefits of any innovation they create accrue to the firm, not to themselves. If the innovator owns her own small firm, her property rights over her innovation are more secure. But small firms may have difficulty obtaining financial backing because the innovators who own them may have difficulty assessing their innovations' economic viability and communicating this to potential backers. Big firms flush with cash from quasi-monopolistic markets are in better positions to fund R&D. But Betz (1997) raises another problem: the managers of large firms may feel their dominant position threatened by new technology or business practices they do not understand. Betz argues that top IBM managers delayed that firm's

entrance into the personal computer business because, as mainframe computer engineers, they feared a loss of personal power if mainframes became less important to the company.

Empirically, new firms seem to be important. He *et al.* (2001) find that greater turnover in the list of a country's largest corporations is empirically associated with higher productivity growth, and thus argue that the vested interests of those in charge of established corporations must be more economically important than the assets associated with corporate survival. They conclude that productivity enhancing growth, which they associate with creative destruction, requires the emergence of new firms.

Regardless of whether creative destruction occurs via the formation of new innovative firms or via the continual R&D investment of established firms, corporate governance now takes on a primary importance it lacked during catch-up growth.

Finding investments with $\pi_{ijt} = f_{ij} - r_t K_{ijt} + \eta_{ijt} > 0$ requires investing to expand the information set available to the corporate decision-makers running firm j from $\Psi_t + \Delta\Psi_t$ to $\Psi_{j,t+1}(R\&D_{jt}, \Psi_t + \Delta\Psi_t)$ where Ψ_t is the country's initial supply of knowledge, $\Delta\Psi_t$ is the now fully exhausted exogenous increase in knowledge that allowed catch up growth, and $R\&D_{jt}$ is firm j's investment in innovation.

Finding quasirents is now expensive, and the quasirents depend on firm j possessing a unique knowledge advantage over other firms. Such advantages are likely to be fleeting, even when protected by patents or secrecy. Large forecast errors in η_{ijt} due to sloppy financial control and negative biases in η_{ijt} due to agency problems are very likely to leave π_{ijt} below zero.

Profitable innovation is difficult. It requires rare people of unusual ability, both to come up with innovations themselves, and to create markets for new products. Ordinary people were able to run corporations, banks, and government economic ministries well during catch-up growth because the path ahead was clear and well illuminated. Extraordinary people are needed in critical decision-making positions in economies growing by creative destruction. The quality of capital allocation decisions mow matters at least as much as the quantity of capital available for investment. In short, corporate governance matters.

6.2 Anglo-American Institutions and Corporate Governance

The institutional system in which the quality of corporate governance attains the greatest importance is the Anglo-American system.[4]

In the Anglo-American system, innovative new firms can be financed readily - either via venture capital pools or via initial public offerings (IPOs) in equity markets. Junk bonds also allow debt market financing for these firms. This system allows entrepreneurs to quickly start and expand their own new firms. This route has been followed recently by firms such as Microsoft, Sun Computers, and Intel. These companies did not exist only a couple of decades ago.

The Anglo-US system also punishes the executives of poorly performing established firms. Morck et al. (1989) find that US CEOs are fired by their boards when

[4] See La Porta *et al.* (1998) for a detailed comparison of corporate governance practices in different countries.

their firms do poorly, and that when boards fail to act, the firms become takeover targets. Corporate takeovers are, of course, another way to remove the underperforming firm's top managers. Increasingly, executive and director pay is in the form of stock options, so that poor firm performance has immediate and personally important consequences for those responsible. Outside directors, institutional investors, and shareholder rights activists all act to expose and oust inept or dishonest top managers. All of these corporate governance mechanisms matter because, when growth by creative destruction is essential for continued prosperity, the quality of each major capital allocation decision is important.

6.4 Alternatives to the Anglo-American System

What are the alternatives? In the Anglo-American system, the leading role of the stock market comes at the expense of banks and government ministries. In principle, banks and government officials might be able to identify and finance innovative entrepreneurs as well as markets can. In practice, this is not observed. Beason and Weinstein (1996) show that Japanese government money tended to flow to the least economically viable segments of the economy, not to those with the greatest potential. This is probably because governments are properly concerned with redistributive welfare. However, this concern undermines their ability to fund creative destruction, which necessarily entails being responsible for "destruction". Morck et al. (2000) show that those Japanese firms most dependent on bank financing are also the most economically weak.

Romano (1993), La Porta *et al.* (1998) and others argue that Anglo-American institutions are superior to the alternatives. Nonetheless, the long-term economic success of countries like France and Germany, which rely heavily on state industrial policies and banks, respectively, for capital allocation and corporate governance oversight is undeniable. If Anglo-American institutions *per se* are not at the crux of growth by creative destruction, what is?

7. The Functional Efficiency of the Stock Market

The key to the Anglo-American system is the use of the stock market as a central information processing device. IPO financing and the corporate governance mechanisms listed above depend critically on stock prices accurately measuring the present value of the business activities the firm is undertaking. That is, the stock market must be informationally efficient. If stock prices are too high or too low, too much or too little money will flow into new businesses via IPOs. If stock prices rise irrationally, corporate executives are rewarded, and if stock prices fall irrationally, corporate executives are punished. The Anglo-American system then fails to deliver economically efficient corporate governance.

7.1 Defining Functional Efficiency

Tobin (1980) refers to the stock market as *functionally efficient* if it delivers economically efficient corporate governance. Durnev *et al.* (2001) call the hypothesis that stock price fluctuations cause economically efficient corporate governance as the *functional form of the efficient markets hypothesis*.

Some critics of stock markets, most notably Porter (1990), argue that stock prices are often "wrong" because of a shareholder myopia effect. Stock prices are said to rise and fall with short-term earnings rather than with the long-term prospects of the firm, and this causes an inordinate concern inboard rooms with the short term and a neglect of long-term investments. This contention is flatly false. McConnell and Muscarrella (1985) and Chan *et al.* (1990) find that US firms' share prices rise sharply when they announce increases to long-term investment by raising either capital spending or R&D spending. Hall (1993) finds US firms stock market values to be elevated in proportion to their R&D spending. In short, US shareholders rush to buy the stocks of firms that undertake long-term investments. Shareholders clearly like it when firms take a more long-term perspective, and rush to buy the stock of firms that do so.

Other critics of stock markets like to emphasize the market frenzies and crashes that periodically afflict stock markets as economies adjust to the sorts of economic dislocations Kindelberger (1978) studies. This critique deserves more respect. These events clearly occur, and have certainly been associated with economic instability. It seems plausible that stock market manias and crashes reflect deviations from rationality of the sort Kindelberger posits.

However, the issue at hand is not that stock markets are perfectly efficient, but that they are better mechanisms for financing growth through creative destruction that the alternatives. *The stock market need not be perfectly functionally efficient.* It must only be more functionally efficient than the alternatives.

It is useful in this context to consider different forms of functional efficiency. Our original definition, given above, is quite strong, and is unlikely to be true. We therefore refer to it as:

- THE STRONG FUNCTIONAL FORM OF THE EFFICIENT MARKETS HYPOTHESIS: Stock price fluctuations cause economically efficient capital allocation.

Restatements of this more likely to fit the real world are:

- THE WEAK FUNCTIONAL FORM OF THE EFFICIENT MARKETS HYPOTHESIS: The stock market is <u>at least as good</u> at delivering economically efficient capital allocation as alternative institutional arrangements.

and an alternative restatement, which we dub:

- THE SEMI-STRONG FUNCTIONAL FORM OF THE EFFICIENT MARKETS HYPOTHESIS: The stock market is <u>better</u> at delivering economically efficient capital allocation as alternative institutional arrangements.

The precise definitions of 'at least as good' and 'better' are best left vague at this point, although a definition having to do with the sizes of Harberger triangles lies behind these words.

7.2 The Curious Characteristics of Japanese Stock Prices

Financial economists often find it convenient to partition the variation in firms' stock returns into systematic variation and firm-specific variation. Systematic variation is variation common to all stocks in the economy, while firm-specific variation is variation unique to the individual firm's stock. This partition is usually operationalized with an 'asset pricing model.' The simplest asset pricing model is the market model, which posits that firm j's stock return at time t, denoted r_{jt} is given by

[9] $$r_{jt} = \alpha_j + \beta_j r_{mt} + \varepsilon_{jt}$$

where r_{mt} is the return of the market, the parameters α_j and β_j are fixed for firm j, and ε_{jt} is a residual. The variance of r_{jt} then consists of

[10] $$\text{var}(r_{jt}) = \beta_j^2 \text{ var}(r_{mt}) + \text{var}(\varepsilon_{jt})$$

We refer to the first term of the righthand side of this equality as the systematic variation in stock j's return, denoted $\sigma_{mj}^2 = \beta_j^2 \text{ var}(r_{mt})$. We call the second term the firm-specific variation in stock j's return, and denote this $\sigma_{\varepsilon j}^2 = \text{var}(\varepsilon_{jt})$.

The fraction of the variation in r_{jt} that is systematic is the R^2 of [12] estimated as an ordinary least squares linear regression, for

[11] $$R_j^2 = \frac{\sigma_{mj}^2}{\sigma_{mj}^2 + \sigma_{\varepsilon j}^2}$$

Morck et al. (2000) perform this variance decomposition for a large number of stocks in a large cross section of countries. Their basic findings are illustrated in Figure 6. Almost all the variation in US stocks is firm-specific, and the same is true in almost all other advanced industrial countries. In contrast, a very large fraction of stock return variation in emerging economies is systematic variation.

Indeed, ranking countries by market model R^2 and by *per capita* GDP give very similar orderings with one prominent exception: Japan. Although Japan has the *per capita* GDP of a developed economy, its stock prices resemble those in less developed country stock markets. Japan is marked in balck in Figure 6 to distinguish it from all other countries, which are shown in gray.

Morck *et al.* (2000) show that their finding is clearly not an artifact of country size, stock market size, macroeconomic volatility, econmy diversification, or even the systematic component of firm-level earnings variation. This is beause *per capita* GDP continues to explain their aveage return decomposition, with higher per capita GDP linked to less synchronous stock returns, after exhaustively controlling for these and other effects.

They do, however, find that measures of the quality of institutions, such as government corruption, respect for the rule of law, efficiency of the judicial system, and the like explain returns variation decomposition better than *per capita* GDP, with low

corruption associated. They interpret their result as indicating that low corruption is associated with less synchronous stock returns.

7.3 Stock Price Synchronicity and Functional Efficiency

Wurgler (2001) measures the tendency of capital to flow towards higher value added industries in a cross-section of countries, and interprets a high tendency as indicative of high quality capital budgeting. He finds that countries with more developed financial markets allocate capital more efficiently. Intriguingly, using the market model R^2 measure of Morck *et al.* (2000), he also finds that capital is allocated more efficiently in countries whose stock prices more asynchronously.

Durnev *et al.* (2001) estimate marginal *q* ratios, as defined in [7] directly for US industries, and correlate them with synchronicity, measured as in [11]. They find that marginal *q* ratios tend to cluster near one in industries where stocks' R^2s are low, and to spread out both above and below one in industries where R^2s are high. Their findings are summarized in Figures 6 and 7.

It follows from Wurgler (2000) and Durnev *et al.* (2001) that asynchronous stock returns are associated with a more functionally efficient stock market. In short, the worse the fit of the asset pricing model, the more functionally efficient the stock market.

Why is this apparently paradoxical outcome economically sensible? Morck *et al.* (2000) and Durnev *et al.* (2001) argue that a functionally efficient stock market must distinguish well-run from poorly run firms so as to direct capital to the former rather than the latter, so that corporate governance mechanisms can reward the managers of the former and punish or oust the managers of the latter, and so that managers can reassess their decisions in light of shareholders' opinions. All of this requires that the stock prices of some firms rise as those of other firms fall. If stocks tend to rise and fall en masse, the stock market provides scant help in allocating capital to one firm rather than another.

But this begs the question of why stock returns are less synchronous in some countries than others, after controlling for fundamentals synchronicity, macroeconomic instability, etc. French and Roll (1986) and Roll (1988) find that firm-specific information enters stock prices primarily via the trades of informed private investors. This leads Morck et al. (2000) to speculate that traders possessing information about specific firms are rarer in some countries than others. They propose that more widespread corruption, less respect for the rule of law, and less efficient judicial systems make gathering and processing information about individual companies less remunerative. This environment renders corporate information releases less trustworthy, raising the cost of estimating fundamental values. This raises the costs of firm-specific stock arbitrage. It also breaks the link between earnings and dividends, so that even if investors could predict the prospects of individual firms, that information might not help in predicting stock prices. This lowers the return of firm-specific stock arbitrage. Finally, an absence of informed trading leaves noise traders free to move prices. De Long *et al.* (19xx) show that a noise trader dominated stock market should exhibit heightened systematic returns variation relative to systematic fundamentals variation. This is because noise traders are prone to herding, and tend to either buy en masse or sell en masse. Thus, more information-laden stock prices move more asynchronously.

The high degree of synchronicity in Japanese stock returns can therefore be taken as a sign of 'information lite' stock prices. To the extent that Japanese capital allocation

depends on stock price movements, this is indicative of poor quality capital allocation. Even if capital budgeting decisions in Japan have been little influenced by stock prices in the past, during Japan's catch-up growth, they may become more important in the future. Certainly, if Japan begins to rely more on its stock market and less on banks and governments for capital allocation, the information content of its stock prices is important.

7. Policy Implications for Japan

We do not necessarily propose that Japan adopt Anglo-American institutions. Romano (1993) rightly points out that a country cannot pick and choose particular institutional arrangements from other countries, for laws, regulations, and customs are all interdependent. One cannot adopt American corporate governance laws without a stock market, legal system, disclosure rules, and general corporate governance behavior code that match those of the US. As many emerging economies are discovering, finely crafted laws and regulations quickly become dead letters without a supportive environment.

Instead, we cautiously point out what we think to be the key problems facing Japan now.

First, Japan's institutions experienced stress as the country approached the knowledge frontier, and Japan's banks and government responded by artificially depressing the cost of capital for many years to prolong catch up growth. Much of this growth was probably value destroying, with negative NPVs and negative economic profits when evaluated at true costs of capital. This short-term fix leaves Japan's macroeconomy with pervasive excess capacity problems. Since this excess capacity is extensive and was probably never economically justifiable, it is unlikely that conventional macroeconomic stimuli can reduce it greatly in the short or even medium terms.

Second, because Japan's great banking houses financed much of this excess capacity, they are also severely overextended. This leaves them unable to move into venture capital funds, high tech start-ups, or other vehicles used elsewhere to finance creative destruction.

Third, since Japan has clearly converged with the world's most advanced industrial economies, further catch-up growth through capital accumulation is not possible. Pushing interest rates down is not a solution, and is likely to cause more trouble in the future as the economy must absorb even more uneconomic excess capacity.

Fourth, Japan need more informed capital allocation decisions in the future. A more functionally efficient stock market is one way to bring this about. Figure 6 shows that the most asynchronous stock prices are to be found in the United States. The next most asynchronous stock returns are those of Ireland, followed by those of Canada, the United Kingdom, Australia and New Zealand. All six of these low R^2 economies have legal traditions based on British Common Law and use stock markets to allocate capital. However, many countries without Anglo-American institutions, such as France, Denmark, Austria, and Holland also have asynchronous stock prices and consequently, can be expected to have relatively high quality capital allocation decisions. Morck *et al.* (2000) show that shareholder rights laws, combined with a general climate of honesty in government and the judiciary, seem sufficient to induce the information gathering and informed trading that makes stock markets more functionally efficient.

Finally, Japan must rerig itself for creative destruction. Regardless of whether it moves closer to Anglo-American institutions or not, corporate governance must become a central focus of institutions throughout the Japanese economy. In the past, the qualifications for being a top corporate executive sensibly included the skills needed to raise capital from banks or the government. Networking, social sophistication, and other such skills were paramount. Being able to tell a good investment from a bad one was rightly seen as less important. Being innovative was, again rightly, seen as irrelevant.

Now, the situation has inverted, and top executives critically need to be able to tell good investments from bad one, to be innovative, and to encourage innovation by others. These two skill sets are radically different. This would seem to imply that Japan desperately needs an extensive turnover of corporate leaders, so that people with the right skills are in charge of capital allocation.

If the government and the banks are to retain their key roles in capital allocation, the same applies to them.

Unfortunately, the easily available quasirents of catch-up growth let Japan's corporations, banks, and government become inflexible and rife with entrenched, but unproductive, layers of management. The elite of Japan's corporate world are probably best regarded as entrenched vested interests, for instances of CEOs being fired notwithstanding, the positions of most top executives in Japan are very secure by world standards. Hostile takeovers are unknown, institutional investors are quiescent, boards are consensus-oriented, and shareholder rights are weak.

The current tendency to remove intercorporate cross holdings is a start. But this is only a single step. The ultimate goal must be new corporate, banking and government decision-makers with new skills appropriate to creative destruction. Some means must be found to remove these entrenched past leaders. Adopting more of an Anglo-American institutional framework is one possible way of doing this. But Japanese ingenuity may construct another.

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Figure 1
Japanese GDP Growth, 1961 to 1999

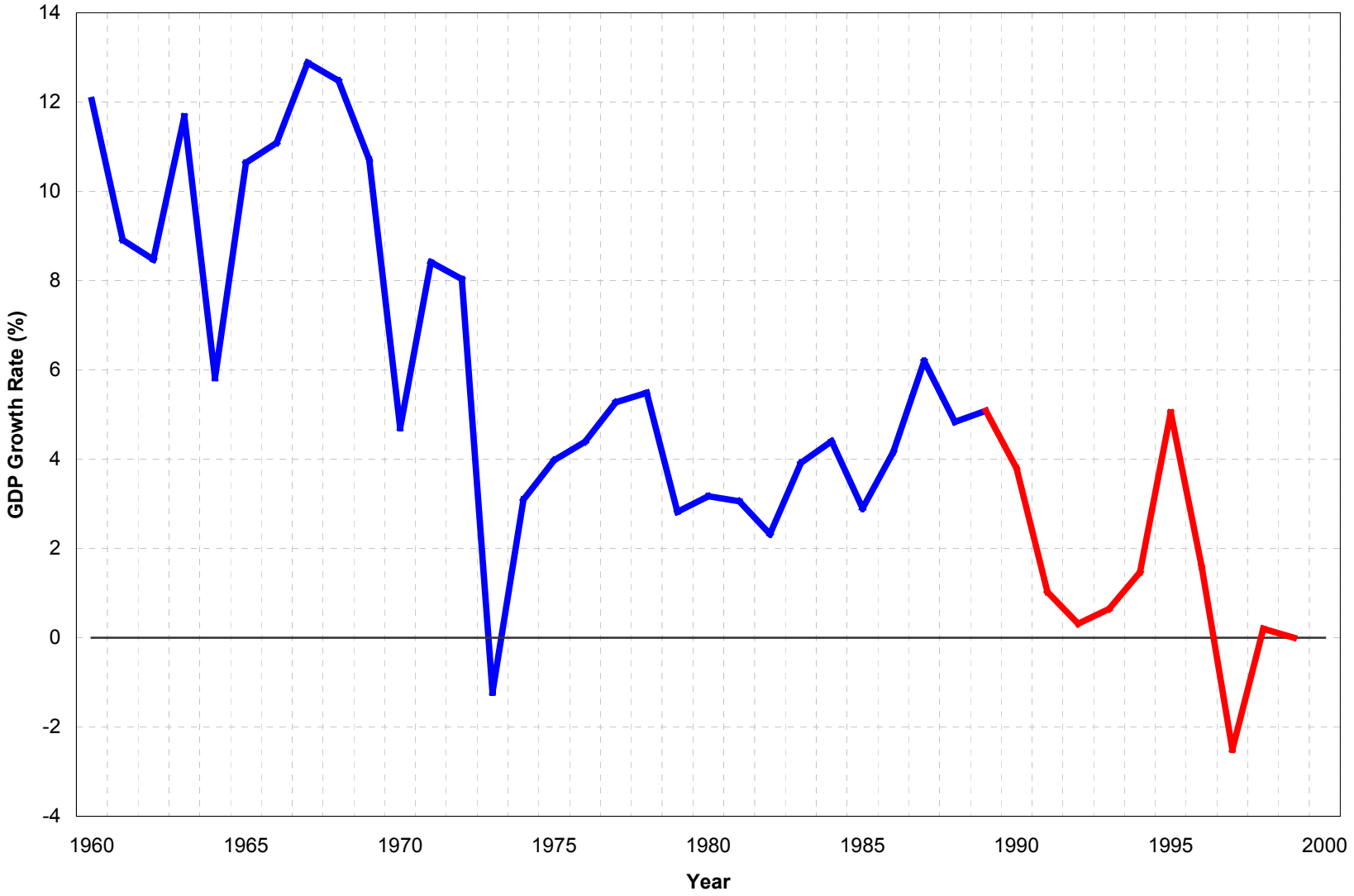


Figure 2
Japanese *per capita* GDP Relative to That of the United States, at Purchasing Power Parity, 1961 to 1999

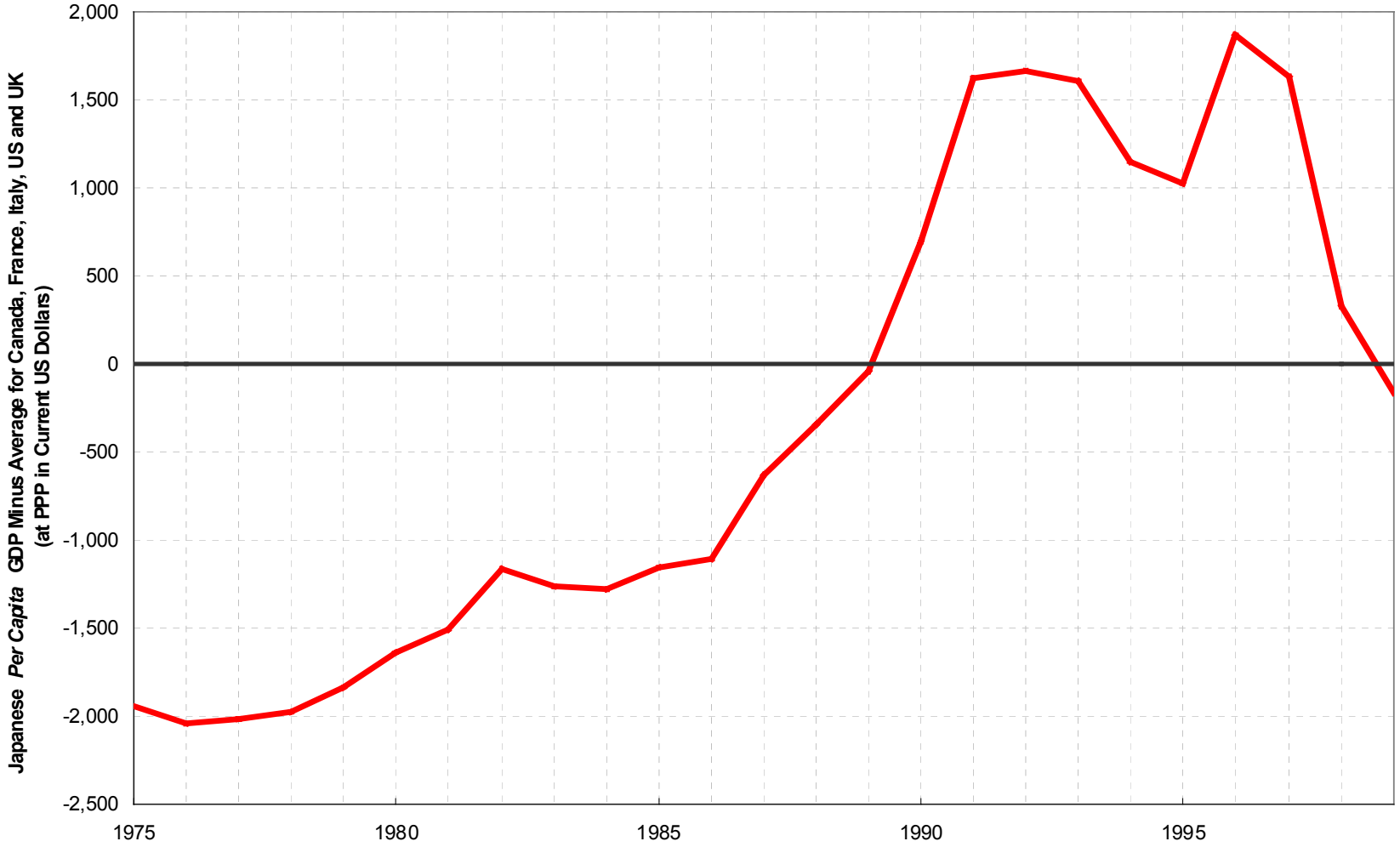


Figure 3.
A Stylized Example of a Firm's Capital Investment Opportunity Schedule

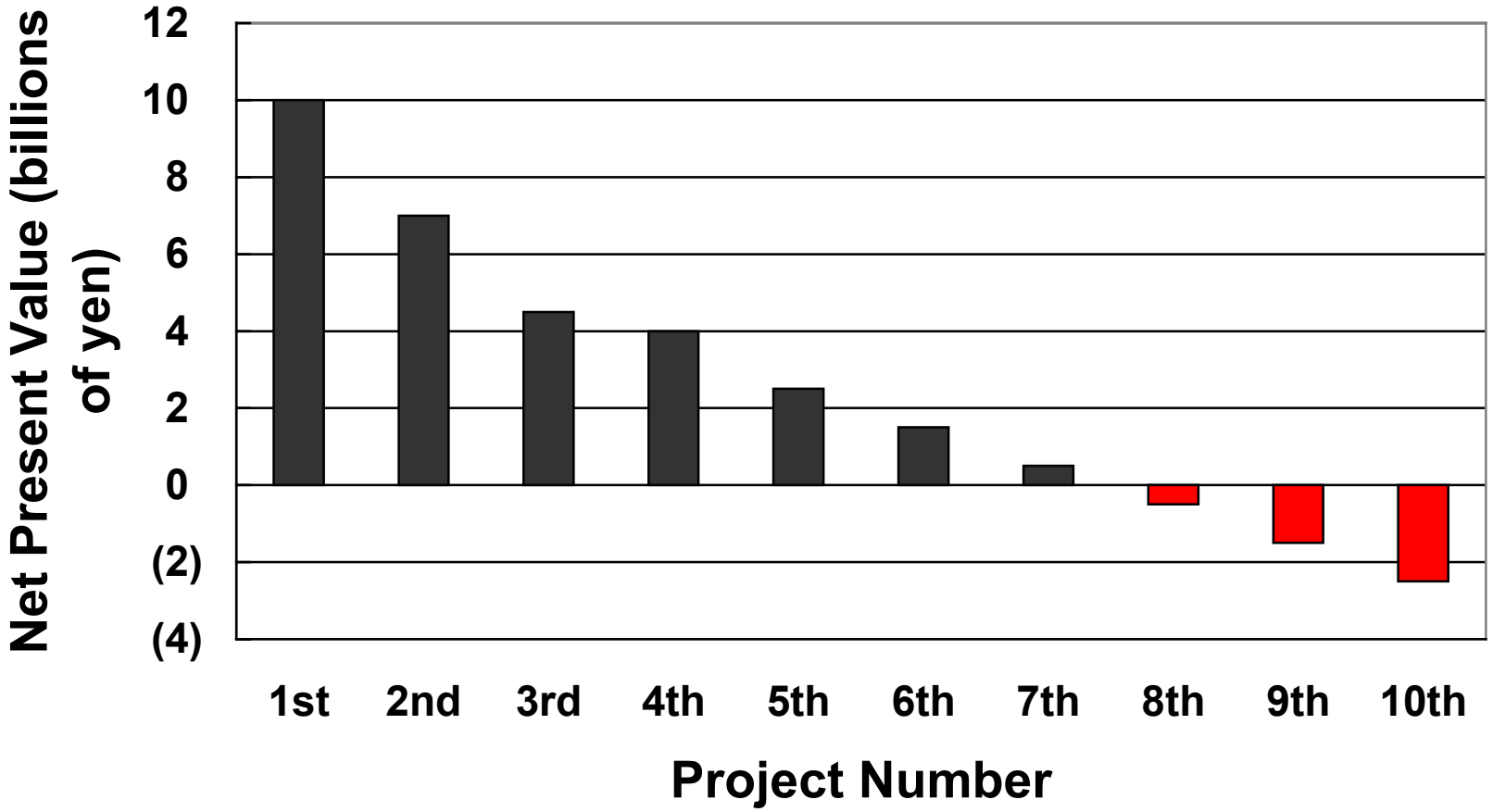


Figure 4
Japanese and US Real Interest Rates, 1960 to 1996

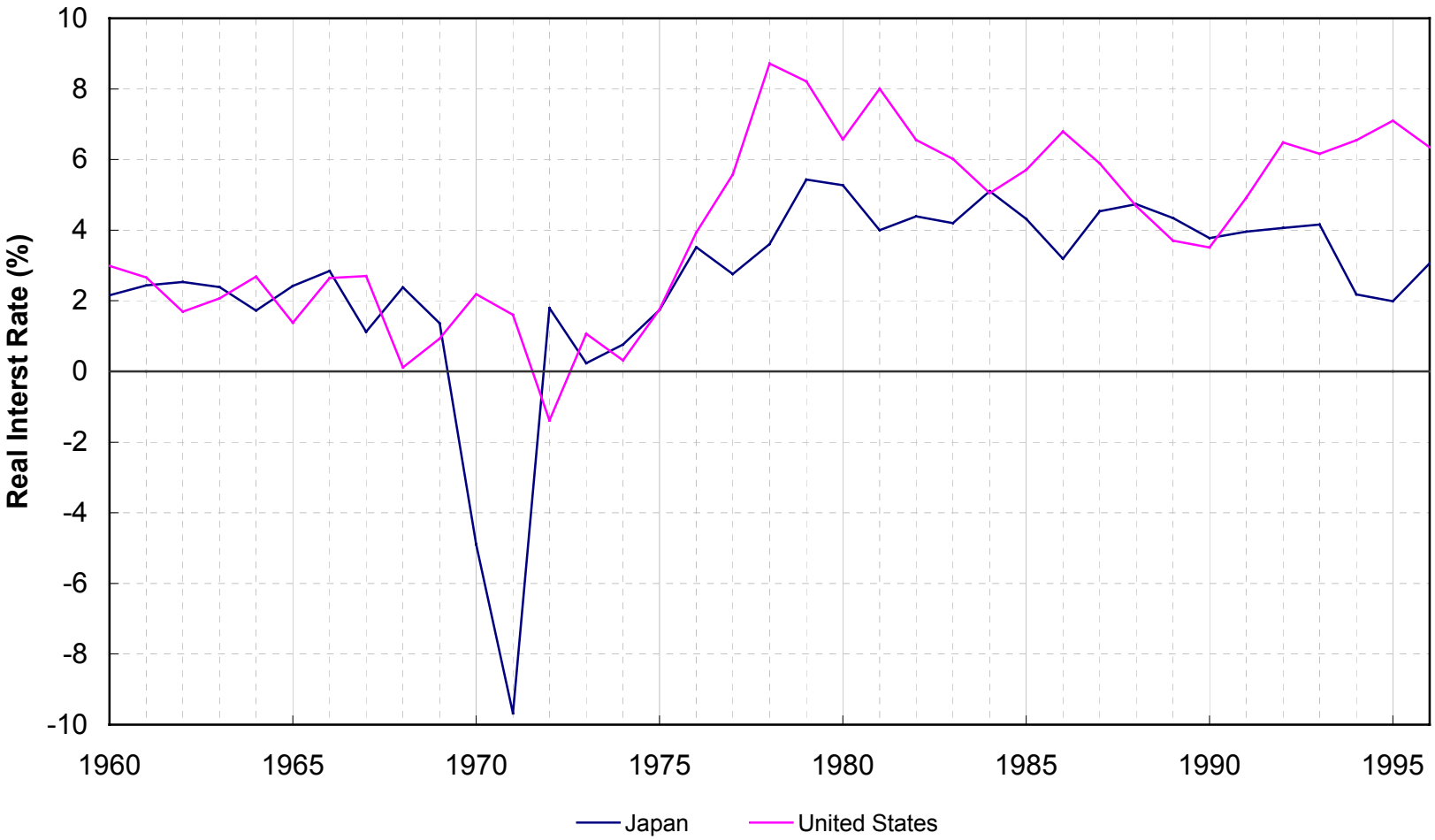
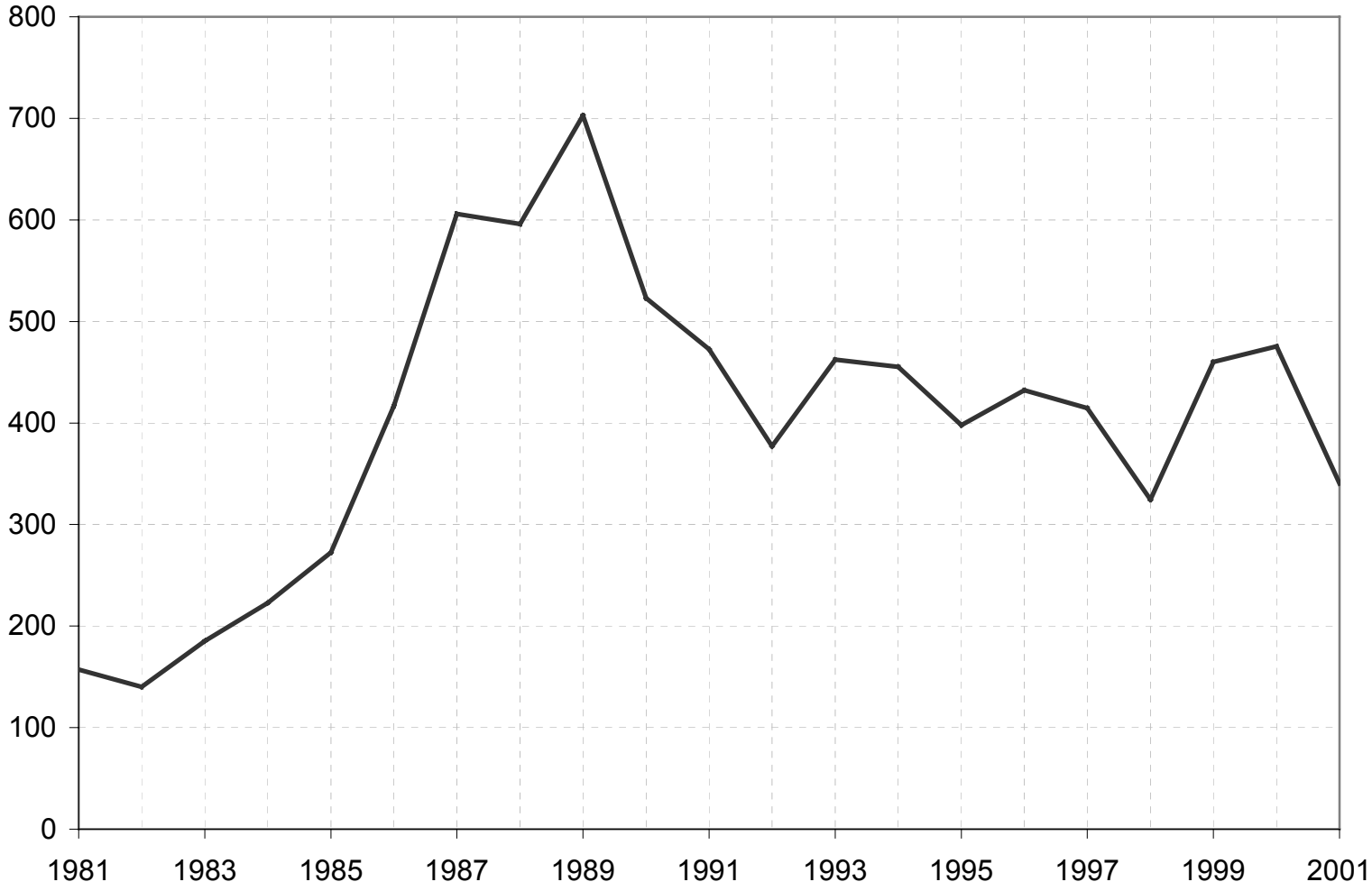


Figure 5
The Japanese Stock Market
Total Return Index for the Japan Stock Market Value, 1981 to 2001



Source: DataStream

Figure 5
Variance Decomposition of Japanese Stock Returns
Systematic Variation as a Fraction of Total Variation for the Average Japanese Stock in 1995

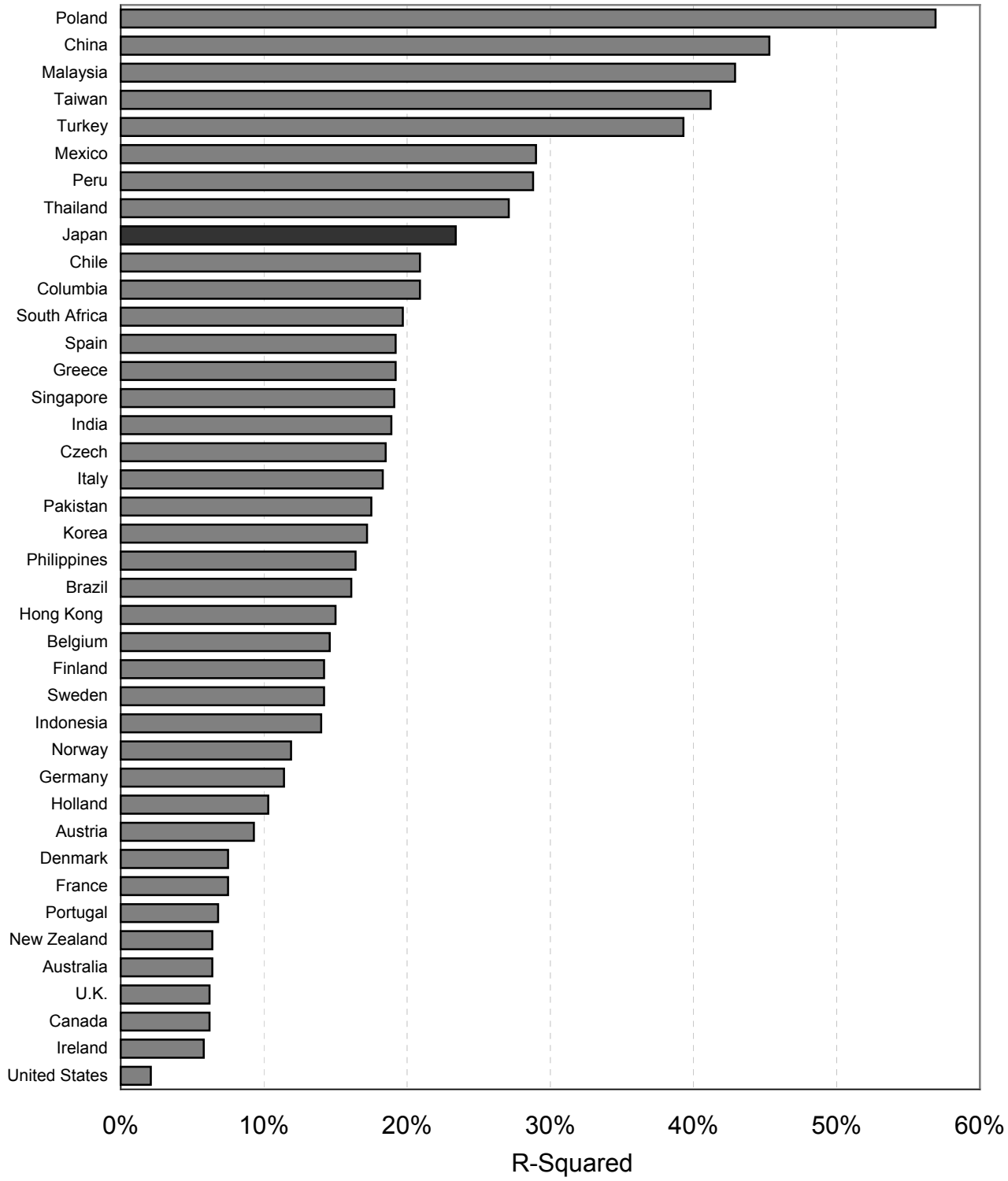
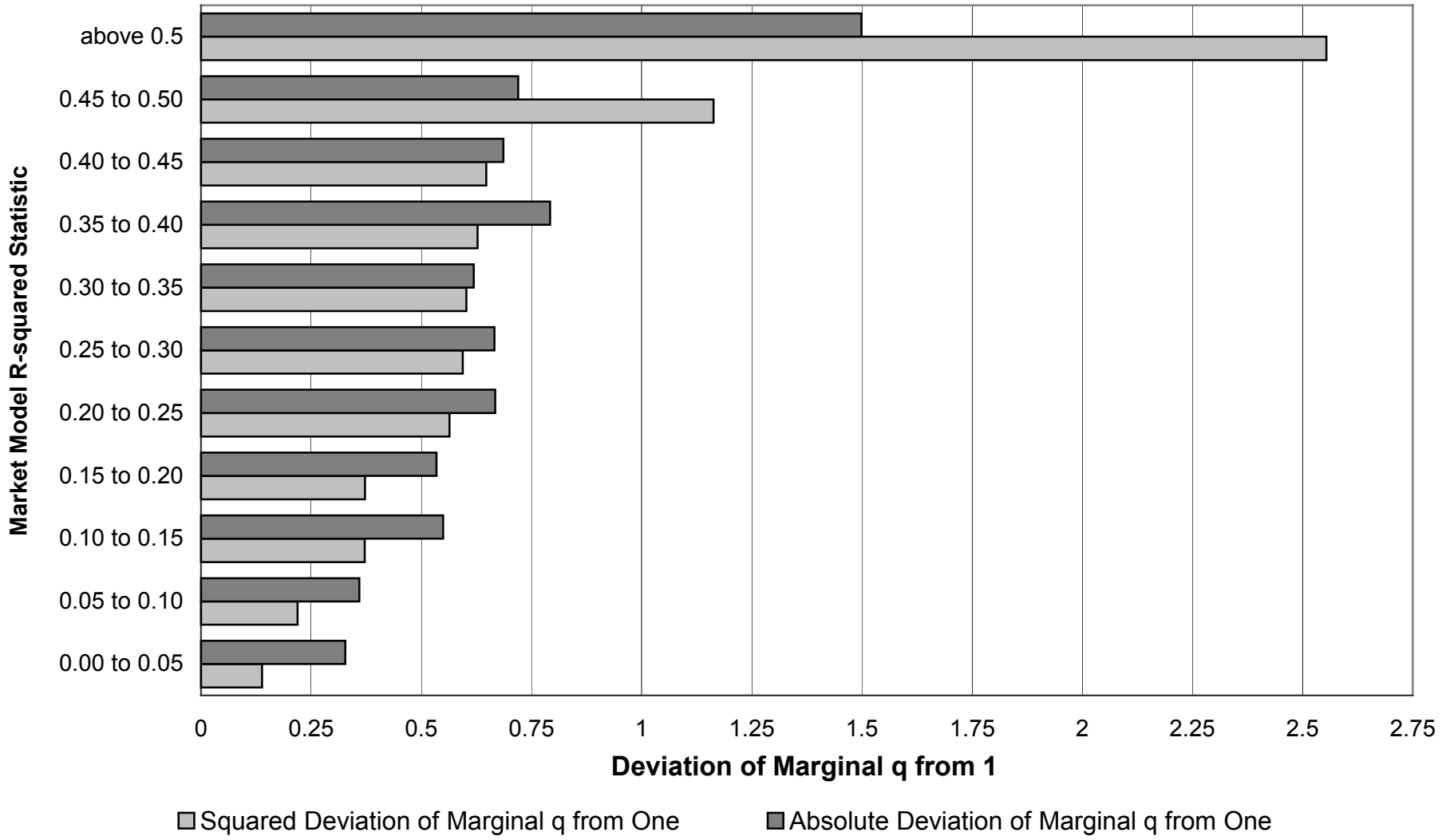
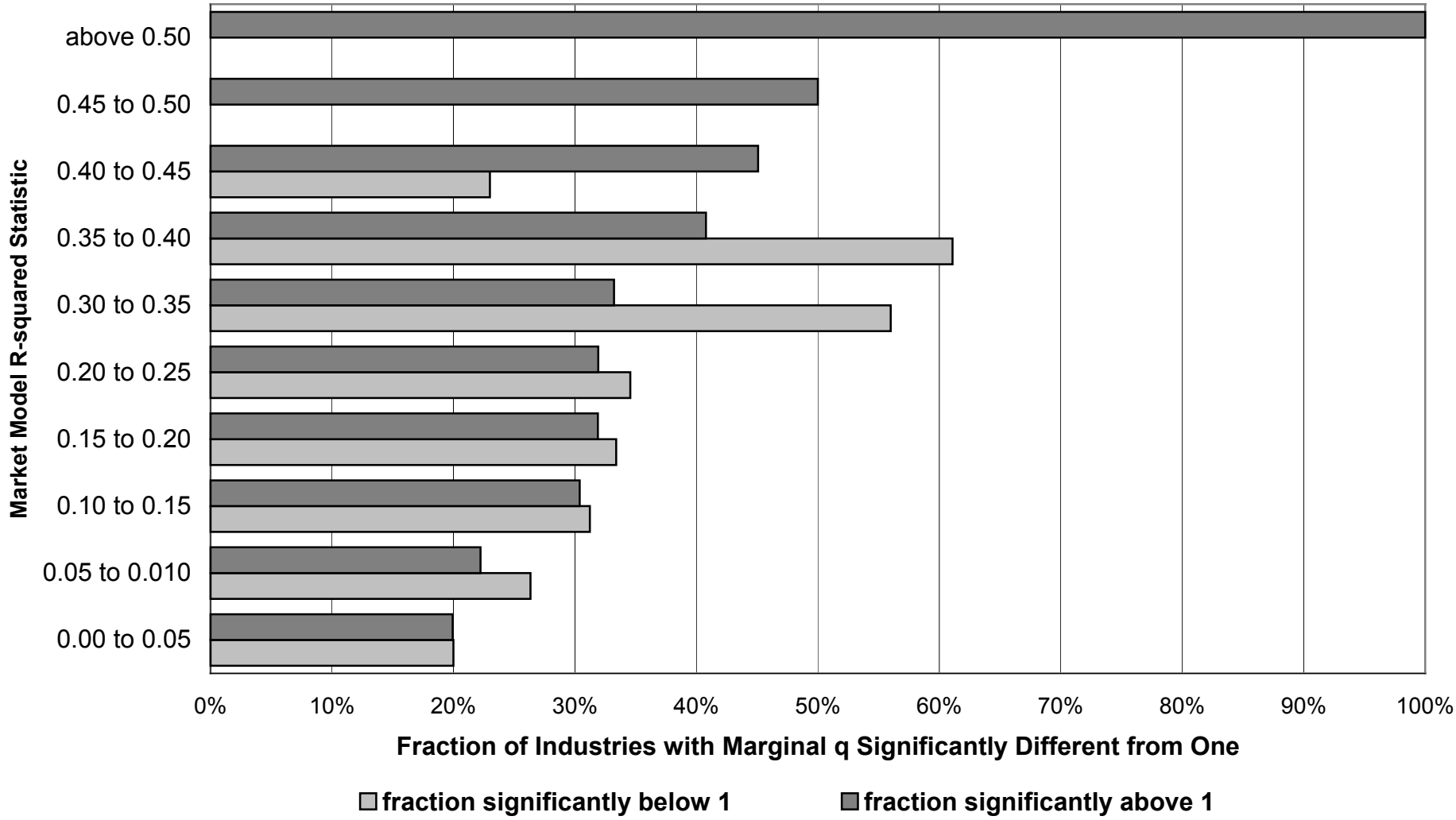


Figure 6
The Quality of Capital Budgeting Across US Industries, as Measured by the Deviation of Marginal Tobin's q from One with Industries Grouped by Industry-Average Firm-Level Market Model R^2. A low R^2 Indicates High Firm-specific Return Variation Relative to Market and Industry-related Variation



Note. This figure presents the relationship between the quality of capital budgeting variables ($(\dot{q}-1)^2$ and $|\dot{q}-1|$) and relative firm-specific stock return variation. The length of a bar is equal to the group average value of the corresponding variable. Source - Durnev et al. (2001).

Figure 3
The Quality of Capital Budgeting Across US Industries, as Measured by the Deviation of Marginal Tobin's q from One with Industries Grouped by Industry-Average Firm-Level Market Model R^2. A low R^2 Indicates a High Firm-specific Return Variation Relative to Market and Industry-related Variation



Notes for Figure 3. This figure presents the relationship between the quality of capital budgeting variables ($(\dot{q}\text{-}1)^2$ and $|\dot{q}\text{-}1|$) and relative firm-specific stock return variation. The length of a bar is equal to the proportion of corresponding variable significantly below or above 1 at 10% level. Source - Durnev et al. (2001).