

Investing in JAPAN

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Video

An interview with Masayuki Naoshima, minister for economy, trade and industry



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Strong reasons for optimism remain

There have been early jitters for the government but the country remains a powerhouse of technology and craftsmanship, writes Mure Dickie

When Japan's imperial court finally succeeded in toppling the long-ruling Tokugawa shogunate in late 1867, senior nobles soon discovered they faced an even greater challenge: deciding what to do next.

A first policy gathering of key courtiers "failed to reach a decision", according to historian Donald Keene. "Proponents of rule by the emperor had not given adequate consideration to the problems they were likely to encounter when they assumed responsibility for government," Prof Keene wrote in his history of the era.

That inauspicious start to what is now known as the Meiji Restoration – a political turning point that catapulted Japan into modernity – should be a source of comfort for interested observers of the nation's most recent revolution.

For while Japan's new Democratic Party has undoubtedly made history by ending the long conservative dominance of post-war politics, the party and its scholarly prime minister Yukio Hatoyama have since often appeared unready for the realities of power.

Torn between the conflicting need to shore up a fragile economic recovery and repair the state's battered finances and deeply divided on how to handle a high-profile dispute with the US about a military base, the DPJ government has seen its ratings slump and faced a barrage of criticism from the media.

Perceptions of uncertain government have also fuelled a few ripples of concern among international investors about the sustainability of debt levels. Nor are many analysts entirely



Trial of leadership: prime minister, Yukio Hatoyama, and his Democratic party of Japan have sometimes seemed unready for the realities of power

convinced by the much-heralded blueprint for a new growth paradigm published in December. "The DPJ's just-released 10-year 'growth strategy' document offers neither growth nor strategy," sniffed the *Oriental Economist* newsletter.

Still, by Meiji standards, the current political transformation – dubbed by Mr Hatoyama a "bloodless Heisei Restoration" after the reign-name of the current emperor – is actually a model of orderly progress.

Meiji reformers only started making a policy impact after months of political vacuum and civil war. The current more tranquil transfer of power has

allowed at least some novice DPJ ministers to hit the ground running. A DPJ revamp of government procedures has already gone some way to meeting its pledge to curb the power of the country's elite bureaucracy – and so far without causing any administrative crises.

Nor can the DPJ be blamed for economic problems that developed under the half century of dominance by the Liberal Democratic party it ousted so emphatically last year.

Masayuki Naoshima, a senior DPJ member and now minister of economy, trade and industry, accepts that the nation is facing an "extremely dif-

ficult economic situation", but insists that the foundations are being laid for a true revival.

"The Japanese people have a high level of ability and great potential for the future. As we steadily implement the new strategy, I believe the economy will return to growth and you will be able to invest in this country with confidence," Mr Naoshima says.

There are indeed some good reasons for such faith. While the depth of last year's recession was a reminder of the dangers of over-reliance on external demand, Japan remains a powerhouse of technology and craftsmanship.

Innumerable little-known small and

medium-sized companies still lead in global niche markets, from printer parts to nuclear reactor components, for example.

Also more stodgy sectors, such as services and agriculture, can be seen more as a national opportunity than a problem, given that any success in raising productivity levels would translate directly into economic growth. And DPJ promises to build a better social safety-net and ease the financial burden on parents should go at least some way to supporting domestic demand and boosting the low national birth-rate.

Following through on such pledges

may require greater leadership than Mr Hatoyama has shown so far, however. Opinion polls suggest many voters are losing faith in the wealthy former engineering professor, scion of a celebrated political dynasty, whose collegiate style is seen by critics as mere inability to make tough decisions or impose discipline on an often fractious cabinet.

Mr Hatoyama's vacillation over a controversial US marine base relocation on the southern island of Okinawa has been widely blamed for allowing the issue to become a focus

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Mure Dickie reports from Tokyo on the state of the Japanese economy. Plus interviews with Atsushi Saito, Tokyo Stock Exchange chief executive, Peter Tasker of Arcus Research and Masamichi Yoshizawa, partner at Longreach Group **ft.com/japanvideo**

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Ruling party loses momentum in wake of funding scandals

Politics

The DPJ's approval rating is falling, writes Mure Dickie

When Yukio Hatoyama, Japan's prime minister, cited Mahatma Gandhi's Seven Social Sins in a high-minded speech opening the Diet's 2010 session, members of the opposition Liberal Democratic party scented an opportunity.

After all, the late Indian independence leader's injunctions against "politics without principles" and "wealth without work" could be condemned as hypocrisy, coming from the leader of a ruling Democratic Party of Japan badly battered by fund-raising scandals involving its two most important leaders.

Ichiro Ozawa, the DPJ secretary-general, spent the first weeks of the year under siege from a prosecutorial investigation into a 2004 property purchase by his fund-raising group.

Mr Hatoyama himself was in December forced to pay gift tax on more than ¥1bn (US\$111m) in funds given to him by his fabulously wealthy heiress mother between 2002 and 2008, largesse of which the prime minister says he was entirely unaware.

So LDP Diet members no doubt felt they were scoring an easy political point by responding to Mr Hatoyama's condemnation of the unprincipled politicians and the indolent rich with raucous calls of "That's you!"

Nor was Mr Hatoyama's Gandhi quote the only political weakness exposed in the 51-minute speech. Though packed with lofty goals hard to disagree with (the prime minister set the tone with the bold declaration that he wanted to "protect people's lives"), its lack of detail offered fresh ammunition to opponents, who paint him as an ineffectual leader presiding over a divided cabinet.

Such criticism matters. Despite its historic landslide election over the long-ruling LDP last August, the centre-left DPJ has lost much of its political momentum since taking power in September.

Recent opinion polls put cabinet approval ratings at well under 50 per cent, compared with more than 70 per cent in the government's first weeks. And fading voter enthusiasm will make it much harder for the DPJ to win a majority in a Diet upper house election expected in July.

For the moment, the public appears convinced that the influential but unpopular Mr Ozawa is calling the DPJ's political shots, while confidence in Mr Hatoyama has been further undermined by wavering on high-profile issues such as the planned relocation of a US marine base on Okinawa.

Even many supporters of the DPJ and its desire to transform Japanese politics and government feel disappointed. "I cannot help but wonder whether a leader who appears so uninterested in

the details of his policies and so unwilling to fight for them can be successful in power," wrote Tobias Harris, a political analyst sympathetic to the DPJ, in his *Observing Japan* blog.

Still, it is much too early to write off Japan's political revolution as a failure. A handful of high-profile policy stumbles aside, the transition to a new administration staffed almost entirely by ministers with no prior experience of administration has been impressively smooth.

And the Diet has a cohort of new members from a broad range of backgrounds

Ichiro Ozawa, DPJ secretary-general, spent the first weeks of the year under siege from an investigation into a property purchase

who can gain experience of government.

While Mr Hatoyama's speech was easy to mock, it also demonstrated the possibilities created by the end of the LDP's half-century ascendancy.

Where past prime ministers' addresses were dry policy summaries largely written by bureaucratic committee, Mr Hatoyama's very personal statement embodied the DPJ's determination to ensure that politicians, not unelected officials, set Japan's course. And if the DPJ has yet to transform itself into a fully

convincing ruling party, the LDP is having a much harder time adapting to the realities of life in opposition.

The party is floundering to decide what it stands for. Prosecutors' investigations into the financial affairs of Mr Hatoyama and Mr Ozawa have helped the LDP seize the political initiative, but voters will not forget the long string of much larger graft scandals that marred its own decades in office.

Kaoru Yosano, a former finance minister and party heavyweight, says the LDP needs to do much more than merely exploit DPJ failings.

"First we have to clean up our own party's dirty image... We have to establish that the party has a sense of responsibility, that it has a conscientious future outlook," he says.

"We need a new paradigm that is persuasive and in line with a modern society." Finding a new paradigm will not be easy, however, and the DPJ's hefty lower house majority means it need not fear a few blows from LDP hecklers.

Some analysts say that even scandals and missteps should not prevent a DPJ victory in July's upper house poll.

Still, the ruling party has no room for complacency. A once-supine electorate demonstrated last year that it is now ready to turf out an inadequate government. By the time the next such opportunity comes round in four years, the DPJ must have more to show than lofty rhetoric.

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Investing in Japan

Strong reasons for hope remain

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of worries in Washington about the party's commitment to a cross-Pacific alliance that has been a pillar of regional stability for half a century.

He has also wavered on domestic policy issues, such as which manifesto pledges should be given priority. And scandals surrounding his fund-raising operation and that of DPJ secretary-general, Ichiro Ozawa, have given the battered LDP an opportunity to set debate agendas in the Diet.

"Mr Hatoyama came into office with a lot of questions about his political and leadership skills, and he has answered them – but not in the way he would want to," says Jeff Kingston, professor of Asian Studies at the Japan campus of Temple University.

The diffident prime minister's somewhat otherworldly style and sometimes ambiguous off-the-cuff comments have certainly offered plenty of ammunition to an often hostile press.

Indeed, after he was forced to retract a statement seen as implying he might oppose investigation of Mr Ozawa, Naoto Kan, the deputy prime minister humorously told journalists they should not take his boss's remarks too literally.

"The prime minister is known as 'the alien', so his words have different meanings from those used by us earthlings," Mr Kan said.

Yet failings of leadership do not inevitably mean the country is doomed to fail in its attempt to remould itself for the challenges of the 21st century.

Once they got their act together, the 19th century Meiji revolutionaries forced through big changes, such as the abolition of the warrior class and creation of a centralised state without worrying about vested interests or public opinion.

Any modern-day revolution will be a much more consensual affair, powered in large part by the aggregate actions of individuals, companies and non-governmental organisations.

Reduced reliance on government bureaucracy, more family-friendly lifestyles, and greater business innovation cannot be merely imposed from above.

"I do think that Japan is going through a prolonged process akin to the Meiji Restoration and the [post-second world war US] occupation," says Prof Kingston. "This is the third transformation, but it's not being done by decree or by a small oligarchy. This is something that is being negotiated, and fought over, and spread out over a longer period of time."

As part of these changes, the deeper significance of last year's election was not that it delivered a DPJ government, but that it was a definitive rejection by the electorate of the virtually one-party, LDP-dominated post-war political system.

The full implications of this decision are unclear, but it shows the status quo is no longer an option. Voters have signalled they are willing to sack any government that fails to deliver the changes the nation wants and needs. That in itself is a revolution.

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Reforms will take more than the blink of an eye

Equities

Lindsay Whipp sees opportunities amid the general gloom

The Tokyo Stock Exchange ended 2009 under a dark cloud. On the 20th anniversary of the market's peak of 38,915.87 on December 29 1989, it was trading at a mere quarter of that figure.

It emerged into slightly less murky skies in 2010, thanks to the successful launch of its long-awaited Arrowhead trading platform. The time taken to execute a trade fell significantly to 2 milliseconds by late January, matching global competitors, from times on the previous platform that could sometimes extend to whole seconds. (For comparison, the blink of an eye takes about 300 milliseconds.)

Arrowhead has succeeded in raising turnover and that, along with the emergence of more participants, means the TSE's daily turnover could nearly double by

the summer, says Atsushi Saito, president of the exchange.

However, a state-of-the-art trading platform alone is not enough to pull Japanese equity trading out of the doldrums. The market has never rebounded from the bursting of the asset bubble, which has been followed by years of sluggish growth, a home-grown banking crisis and persistent deflation.

Even though company profits jumped 62 per cent between 1989 and March 2007, the stock market failed to follow suit. Yet when profits tumbled as the global crisis hit, investors sold Japanese stocks as fast as they could, taking the Nikkei index back down to near 7,000.

The TSE and other stock markets in Japan have suffered a sharp decline in listings of new companies, and while the economy has edged out of recession, the outlook is not bright enough to encourage new companies to come to market. Meanwhile, listing regulations in Japan are regarded as particularly stiff.

Mr Saito says: "[Encouraging

IPOs] is the... crucial point. We have to think of a lot of strategies along with the government. One of the effective measures might be tax [such as exemptions for new companies which have innovative technology]. This type of policy has to be adopted by the government first of all."

Mr Saito says the discussion on whether to relax regulations is a tough one, as he does not want to risk listing low-quality companies for the sake of quantity.

Many foreign investors also complain about lax corporate governance, with effects that include the hoarding of cash. Improvements have been made, such as better dividend policies, while increased criticism of governance in other developed countries has had the effect of diminishing the perceived governance gap.

Overseas investors also complain about Japan's lack of hostile takeovers, which can spur markets.

However, most overseas inves-

tors agree that more could be done. Japan's slide from its position as the world's largest bourse by market capitalisation to a poor second, behind the US, with China snapping at its heels, speaks of a much wider problem that needs resolving.

That is the lacklustre domestic economy, dragged down further

'The stock market goes from periods of being loved to periods of being loathed, and these can result in intensive movements'

by persistent deflation and an ageing population, leaving an equity market that does not appeal to many long-term investors with plenty of other markets in which to place their money.

That is not to say that Japan lacks investment opportunities. In the first couple of weeks of 2010, foreign investors showed

net purchases of Japanese equities worth \$16bn, as they started to rebalance their very underweight positions.

"[The] Japanese stock market goes from periods of being loved to periods of being loathed, and these can result in intensive movements – both up and down," says Peter Tasker, an analyst at Arcus Research.

He adds: "Generally, foreigners are the swing investors who make the difference. When they come to Japan, and they see it moving, they rush."

"It's appreciated that Japan is a big laggard, that the valuations are pretty cheap. It is also realised that in a global economy which is perhaps confronting a bout of tightening, Japan – which is really the kind of tail-end Charlie in the whole process – is going to be the very last place to tighten."

He says there are "pockets of value" in leading Japanese companies with good earnings power, as well as some of the small-capitalisation stocks that are growing well in spite of the

current difficult economic climate.

The lacklustre performance of Japanese stocks over the years has led to a reduction in the number of analysts covering companies. Ironically, this creates opportunities, notes Robert Prugue, a senior managing director for Asia-Pacific at Lazard Asset Management.

"Unfortunately, the market has a certain level of inefficiency, as the number of professionals analysing the market compared with its size is substantially smaller than the UK or US on a per capita basis," Mr Prugue says.

"Domestic companies are under-researched, so for investors looking for mis-priced securities there are opportunities."

Both the TSE and the government face an important task in creating an environment that will nurture the new companies vital for Japan's long-term economic growth.

Without that, more dark clouds are likely to overshadow the exchange.



Signs of recovery: government stimulus spending should support a slow recovery from Japan's harshest postwar slump

Bloomberg

Leaders hope spending spree will stimulate recovery

Economy

Country is emerging from worst postwar slump, writes Mure Dickie

Weak domestic consumption, the worst consumer price deflation on record, a huge and growing government debt burden and a falling tax-take – these are some of the challenges facing the novice stewards of Japan's economy amid the nation's fragile recovery from its harshest post-war slump.

Amid fears of a "double-dip" recession in the first half of the year, policymakers of the ruling Democratic party have already had to put aside some of their more generous campaign pledges and their hopes for fiscal rectitude.

Instead, the government has drawn up a ¥7,200bn (\$80bn) stimulus package of extra spending for the year to March and a record ¥92,300bn regular budget for the 12 months starting in April.

This spending splurge should be enough to ensure a continued steady – albeit

slow – recovery, says Masayuki Naoshima, a former union organiser at Toyota who in September became the DPJ's first minister for economy, trade and industry.

"With the budgets taking effect, we will be able to see a moderate recovery," Mr Naoshima says.

He adds: "There are risk factors, such as deflationary pressures and a worsening unemployment situation, but if we can overcome these problems in the first half, then I am confident that the economy will be able to stay on a recovery track."

Shoring up growth will exacerbate fiscal stresses, however. The fierce recession that gripped the economy in 2008 and early 2009 sent the tax-take plunging. In the year to March, tax revenues will be worth less than government bond issues for the first time since 1946.

And despite one-off raids on "hidden treasure" funds buried in the national budget, bonds will again be the biggest source of government income in the year from April.

Still, few doubt that the government has little choice but to spend.

The global slowdown cruelly exposed Japan's

dependence on exports for growth.

During a visit to Tokyo in January, Dominique Strauss-Kahn, managing director of the IMF, called on policymakers to draw up convincing plans for an eventual return to fiscal sustainability – but stressed that it should be implemented only when it was clear there was enough private demand.

VIDEO ON FT.COM

Mure Dickie, FT Tokyo Bureau Chief, finds the country still in the grips of its worst recession since the second world war. This and more at www.ft.com/japanvideo

"The need to avoid any risk of a downturn is still there," Mr Strauss-Kahn said. But while the DPJ government is keeping the spending spigot open, some ministers believe the Bank of Japan is failing to respond effectively to a bout of the consumer price deflation that dogged the economy for much of the past decade.

Political pressure on the legally independent central bank is still much weaker than under past Liberal Democratic governments,

but Naoto Kan, who replaced the fiscally more hawkish Hirohisa Fujii as finance minister last month, has repeatedly signalled he wants it to take a more active role.

Whether the BoJ offers anything more than a symbolic response will depend largely on whether it continues to see price falls as a relatively harmless symptom of the economy's output gap, or whether it judges that they are turning into a dangerous "deflationary spiral", in which price expectations suppress activity in a vicious circle.

In the meantime, DPJ efforts to redirect state spending toward individuals through hand-outs for parents and more generous welfare – part of a broader effort to reduce the economy's reliance on exports and state construction for growth – should help support domestic demand.

By issuing an outline New Growth Strategy in December, the government is also seeking to show that its plans go well beyond wealth redistribution.

Promotion of such sectors as environment-related technologies, healthcare and greater engagement with Asian neighbours will help create jobs and ensure growth, Mr Naoshima

argues. But many economists are unimpressed by the policy blueprint, scheduled to be fleshed out with more detail by June.

"We are sceptical whether simply pointing out areas of obvious growth potential can be regarded as a growth strategy," wrote Kiichi Murashima, economist at Citigroup Global Markets in Tokyo, in a research note, expressing dismay at a lack of DPJ enthusiasm for market liberalisation.

Others say that the growth strategy, like much DPJ policymaking so far, has avoided making the kind of tough decision about allocation of resources that will increasingly be needed to make the most of fiscal resources.

DPJ supporters can point to exceptions: the fiscal 2010 budget does promise an 18 per cent cut in spending on public works and the government has put on hold some manifesto pledges including a planned cut in petrol tax.

Mr Naoshima also points out that the new government's economic and fiscal policies should not be judged on just four months in office.

"Now that the budget has been agreed, things will look very different in a year or so," the minister says.

Ambitions to recapture its glory days

Osaka exchange

Start-ups are vital to the plans, says Lindsay Whipp

A short drive away from the Osaka Securities Exchange along the banks of the Dojima River is the site of the world's first derivatives exchange, where Japanese merchants started trading rice futures back in 1730.

The Dojima Rice Exchange is now marked by a tiny plot of land with a stone engraving and a sculpture of two children with a sheaf of rice, a monument most walk past without so much as a glance.

In today's global market, Osaka has also paled in significance since its heyday. However, Michio Yoneda, the OSE's president, is preparing for battle to regain its position in the top-10 derivatives markets.

The OSE has struggled to regain its presence in derivatives trading after regulations introduced in the early 1990s meant it lost its position as the world's third-largest futures exchange by turnover, as trading of Nikkei futures shifted to Singapore and the asset bubble burst.

It is still Japan's largest derivatives market but languishes at 15th in the world, trailing emerging markets such as China's Dalian and Zhengzhou Commodities Exchanges.

Whether it can climb back up the rankings depends partly on the introduction of its new trading platform early next year.

Developed by Nasdaq OMX, the new platform will reduce the time it takes for a trade to be completed from 60 milliseconds now to less than 10 milliseconds enabling it to compete with the Singapore exchange and other global markets.

The OSE already offers a co-location service, where its members can place their servers close to the OSE's matching engine.

However, another key development for traders is that the OSE will move its matching engine from Osaka to the Tokyo metropolitan area, where the vast majority of its clients are based.

Transmission between the two cities adds a further 20 milliseconds.

"That [the 20 milliseconds] is a lot of time," says Mr Yoneda. "In the past it wasn't, but now it makes a big difference." With the new platform, the OSE will be able to introduce more products, more quickly.

A current lack of remote members is one of the obstacles to the OSE derivatives market's growth. High tax rates plus regulations stipulating that remote members must have a board of directors has put off overseas proprietary trading houses.

Instead such investors have to trade through member brokers, which increases their costs.

The OSE will decide by the summer whether or not to alter its fee structure to

cut costs for remote members, says Kotaro Yamazawa, a director at the exchange.

The OSE is not only about derivatives trading. It also owns Japan's largest market for small and medium-sized companies, thanks to its purchase last year of the Nasdaq start-up market. Later this year it will merge Nasdaq with its own Heracles market.

Japanese start-up markets have suffered from a considerable lack of investor confidence since internet start-up Livedoor was delisted from the Tokyo Stock Exchange's "Mothers" market in 2006 following the arrest of its founder amid charges of accounting fraud and market manipulation.

Since then, the Japanese version of Sarbanes-Oxley regulations, known as J-SOX, have been brought in, which some regard as tough for small companies to meet.

A combination of these two problems and lacklustre domestic economic growth over the past few years has led to a sharp decline in the number of new company listings. The market is dominated by retail investors and has a

'The start-up markets need to be brought out of their fractured state and improve quality'

lack of liquidity that leaves many stocks subject to volatile movements.

A lack of venture capital in Japan also means that many companies are small when they list, which can limit the number of investors and makes subsequent fund-raising more difficult.

All this gives Mr Yoneda another significant challenge in his attempt to increase the competitive edge of the OSE. Those plans include expanding the number of analyst reports on the companies listed on his newly merged Nasdaq market from about 20 per cent of the merged market's listed companies.

"We have a three-year space [to make improvements to the market]," Mr Yoneda says. "The start-up markets need to be brought out of their fractured state and improve quality."

Mr Yoneda also plans to introduce a new Nasdaq index and, subsequently, futures and options derivatives to expand hedging and trading opportunities.

The OSE may also provide investor relations services to companies listed on its market to help guide them after listing. These services would include helping them with translating financial statements into English to appeal to foreign investors.

More sweeping changes are also in prospect. "The landscape of exchanges in Japan is going to change," says Mr Yamazawa. "There will be more alliances and mergers."

Country still labours under huge debt burden

Fiscal position

Mure Dickie assesses the depth of liabilities

Should Japan's debt burden be measured on a net or gross basis? That is a Y500,000bn question facing anyone worried about the fiscal future of the world's second largest economy.

On a gross basis, general government debt reached a level equivalent to 189 per cent of gross domestic product last year, according to the Organisation for Economic Co-operation and Development. That constitutes a liability mountain far higher and heavier than that of any other leading economy.

But if state-held financial assets are taken into account, net debt was a much more manageable-looking 97 per cent of GDP – the sort of level Italy has sustained for years.

Economists who are relatively sanguine about Japan's debt often cite the net figure – not unreasonably, as anyone who has simultaneously had a mortgage and a savings account will agree.

And a perusal of the national accounts shows that Japanese policymakers do indeed have some deep pockets they can dip into in case of emergency.

General government

financial assets totalled Y551,376bn (\$6,075bn) at the end of fiscal 2007, the most recent year for which detailed data are available.

In theory, this treasure trove would have quite neatly balanced out the then Y551,556bn in outstanding bonds issued by the central government.

Indeed, a hefty chunk of national debt is owned by the state itself. In 2007, arms of the government other than the Bank of Japan held more than Y80,497bn in securities issued by the central government and state institutions covered by its Fiscal Investment and Loan Programme (FILP). The BoJ held another Y63,652bn in such securities.

As well as effectively cancelling out such holdings, the government could also call in time of trouble on the equivalent of more than Y100,000bn that it holds in foreign exchange reserves.

So is the debt problem really only half as large as often thought? Not quite. State financial assets also include plenty of items – such as soft state credit for FILP institutions, companies and consumers – that would be of uncertain value in a fiscal crisis.

Takahira Ogawa of Standard & Poor's, which recently warned that it might cut its sovereign debt rating on Japan for the first time since 2002, says it is next to impossible for outsiders to gauge what the state's financial holdings

would be worth if put on the market.

"Nobody has any clear idea," says Mr Ogawa, who also points out that having such a big balance sheet means Japan could be more vulnerable to market shifts than other states with similar debt-to-GDP ratios on a net basis.

Attempts to net away

Both net and gross measures of debt may understate the government's eventual obligations

fears of a debt crisis must contend with the fact that much more than a third of the government's financial assets – Y229,517bn at the end of December 2007 – are held by social security funds.

That means they are more than matched by obligations to Japan's rap-

idly ageing population and so may be better seen as a source of fiscal concern rather than reassurance.

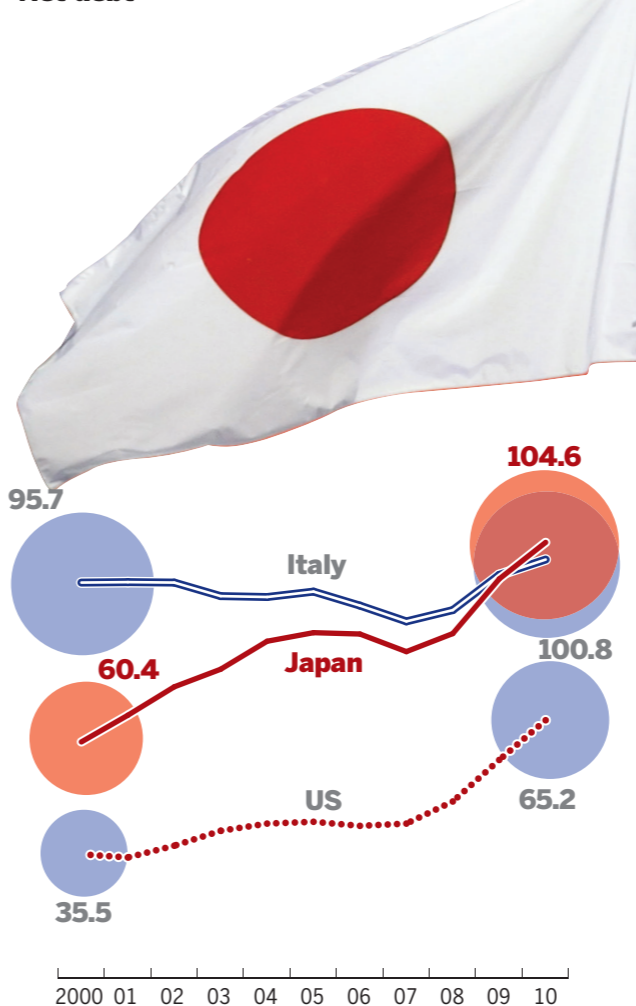
Randall Jones, head of the OECD's Japan and Korea desk, adds that both net and gross measures of debt may understate the government's eventual obligations, as they do not include such liabilities as loan guarantees for quasi-government institutions. The higher gross debt figure could thus offer a "more realistic picture", Mr Randall says.

This is not to say that a crisis is imminent. Predictions that Japan's debt is unsustainable have been a staple of economic and political conversation for a decade and a half, but have so far been confounded by the domestic market's continued appetite for low-yielding state bonds.

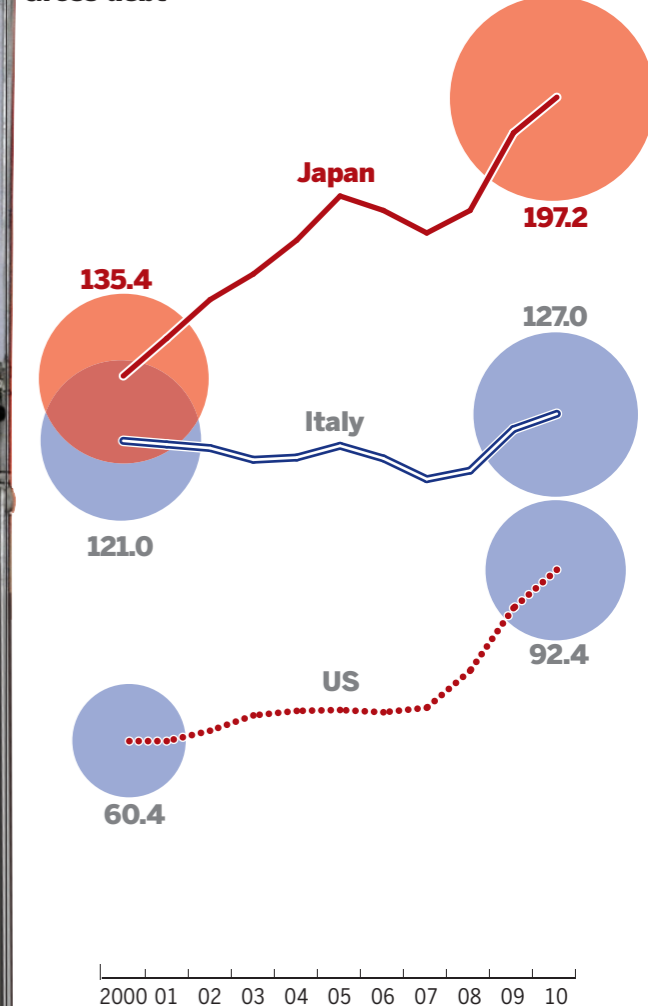
But to draw too much comfort from Japan's net debt data could turn out to be, as it were, a gross mistake.

General government debt as a % of GDP

Net debt



Gross debt



Source: Japanese Ministry of Finance Photo: Reuters

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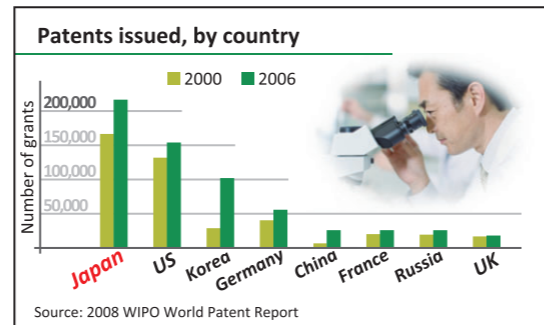


Building A Healthy Relationship

As the global economy recovers from the downturn of the past year, investors from all nations are increasingly looking to Japan. Combining stable growth with continual technological advancement, Japan is providing a wealth of new opportunities for investment and partnership. It was our privilege to speak with Ganesh Nayak, Executive Director of India-based pharmaceutical company Zydus Cadila, to hear his thoughts on the growing partnerships his company has established here.

What factors most attracted Zydus to Japan?

"Innovation is the core of future strategy of any business, be it pharmaceutical or any other," begins Mr. Nayak. "The most important thing that can differentiate one company from another in the same industry is the speed at which it is innovating and bringing new products to the market." More than any other factor in business, innovation is what drives the development of the global economy to produce sustainable growth and long-range profitability. And when investors from around the world look for the innovations that will shape the future of business and society, the one country they all turn to is Japan. Firms in Japan are continually pushing back the boundaries of knowledge in every branch of technology, from biomedical to communications to automotive. In 2006 alone, over 200,000 patents were issued to Japanese researchers, nearly 40% more than the United States, and more than the other six G8 nations combined. The benefits from these discoveries are far more than theoretical, however, with companies and investors reaping the rewards of these breakthroughs.



What differentiates Japan from other nations within your global strategy?

Regardless of field or scale, one thing that technology and manufacturing firms across Japan all have in common is the high priority

they place on research and development. As a percentage of GDP, Japan spends more on R&D than any nation in the world, over 35% more than the US and more than 2.5 times that of China*. This commitment to future innovations, involving the cooperative efforts of businesses, universities and government research facilities has consistently placed Japan ahead of the curve on technological breakthroughs that have launched new product and services for the world market. "Zydus has been investing in differentiated technologies, and our healthy pipeline of differentiated products is what makes us stand out from the crowd," explains Mr. Nayak. "Being forerunners in technology and innovation themselves, we feel that Japanese customers can understand and appreciate this strategy."

What have been your priorities in seeking partnerships here?

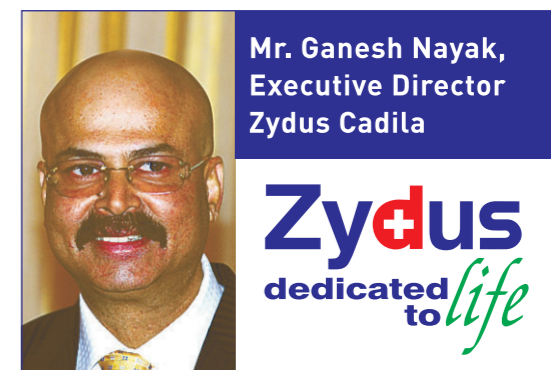
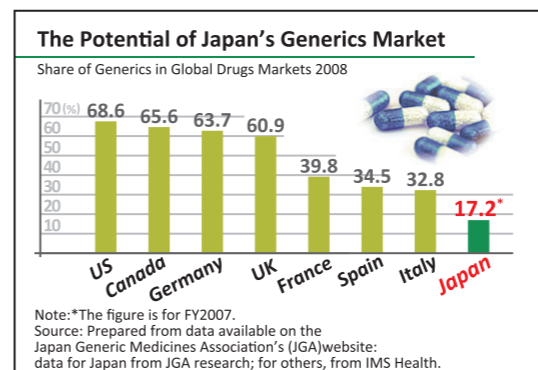
As the world's second-largest pharmaceutical market, with a value of nearly \$60 billion, Japan already plays a major role in the strategic planning of any company in the field. This role will only increase in the coming years, as the Japanese population shifts further toward a graying society, and as the Japanese government pursues its initiatives of promoting the use of generic drugs (see graph below). Mr. Nayak explains the position of Zydus: "For a truly global company, having a presence in Japan is not an option but a requirement. We set up Zydus Pharma

Inc to participate in the generics market, and with the acquisition of Nippon Universal we have already positioned ourselves to participate in this market as it opens up." Firms coming to Japan will find a robust pharmaceutical and healthcare industry with extensive experience in international partnership and drug co-development, as well as a top-tier network of academic facilities and research hospitals equally open to working with their global counterparts.

What opportunities do you see in Japan for the future?

In July this year, the Japanese government announced the formation of the Innovation Network Corporation of Japan, a joint venture between the public and private sectors to create a \$10 billion stimulus for small and medium-sized firms in developing and maturing industries, with the aim of producing cutting-edge solutions in the fields of healthcare, energy and the environment. This initiative is just one of the many public and private incentives in a wide range of fields available to firms from around the world seeking profitable new opportunities and partnerships. Mr. Nayak concludes, "In the Asian context, one can easily place Japan at the top of the pyramid in terms of size, regulations, openness, and fair play. There are equal opportunities for foreign companies as long as they can meet the stringent quality requirements of Japanese customers."

*JETRO, 10 Advantages to Investing in Japan, 2009



Domestic buyers are not shaken

Government bonds

Banks' excess funds continue to underpin demand, says Lindsay Whipp

Imagine a country whose government is planning to issue more bonds in the next fiscal year than all the countries in the European Union combined. Add an existing gross debt burden approaching 200 per cent of gross domestic product, and falling tax revenues, and one would expect bond investors to be worrying about rising bond yields.

But in spite of Japan's bond investors being acutely aware of the problems, benchmark 10-year yields of 1.32 per cent suggest they are not worried.

Total issuance in the year from April is planned at Y162,400bn (\$1,800bn), including a 33 per cent rise in new bonds to Y44,300bn.



'Seventy per cent of savings are held by people of 60 years and older'

Naka Matsuzawa, Nomura Securities

Expectations that the Bank of Japan will keep monetary policy easy amid falling prices combine with concerns about the strength of the economy to help keep yields low. However, the greatest support comes from domestic investors, who hold more than 90 per cent of the market.

The finance ministry's decision to concentrate the biggest bond issue increases in one-, two- and five-year bonds next fiscal year ties in with the continuing strong demand expected from domestic banks looking for somewhere to invest their deposits.

Naka Matsuzawa, chief investment strategist for fixed income at Nomura Securities, says the banking sector will probably experience an increase in excess funds next fiscal year. This is because companies are still not investing, and an end to the fall in profits is increasing those companies'

cash positions. This reduces demand for loans, leaving banks to invest their increased deposits in the government bond market.

This, investors hope, will cover any decline in purchasing by Japan Post Bank. By far the largest Japanese bank by deposits, it is one of the biggest buyers of government bonds but is under pressure to diversify its investments.

Mr Matsuzawa points out that this is a big year for redeeming deposits and postal savings, so the ability of Japan Post Bank to buy government bonds will depend on the redemption rate.

Strategists note that one of the most important factors in the coming year is whether the Bank of Japan increases the amount of government bonds it buys. Mr Matsuzawa is expecting the central bank to increase purchases before the summer from its current level of Y1,800bn a month.

While domestic investors are concerned about Japan's fiscal position in the long-term, foreign investors have argued that debt reduction is a more urgent issue. This was underscored by David Einhorn, president of Greenlight Capital, a hedge fund, in a speech late last year.

His remarks caused volatility in government bond derivatives markets and a short-term rise in cash bond yields as investors shorted the market.

Where the opinions of many domestic and foreign investors meet, however, is in the need for a clear message from the authorities about plans to reverse fiscal deterioration and emerge from deflation.

Perhaps the real potential for change lies with the general public. Unless they start shifting their hard-earned cash out of their near-zero-return bank and post office deposits, those institutions will keep buying government bonds.

"To me, living in Japan and being Japanese, I don't really see an Argentinian [style crisis happening in Japan]," says Mr Matsuzawa, particularly as most of the bonds are held domestically.

"Seventy per cent of [savings] are held by people of 60 years and older, and they have decided to keep [those savings] in the country. They are basically satisfied with their current standard of living, so they do not look for a higher return. So the money will probably stay [in deposits]."



For more information, visit: www.jetro.go.jp/en/invest/

Investing in Japan

Victory is sweet for doughnut venture

Case Study Krispy Kreme

Jonathan Soble on an unlikely success story in snack food

If Japanese waistlines have grown a little bigger in the past few years, the failure of private equity to take off in the country may be to blame.

Does that sound far-fetched? Well, consider this: it was the folding of a buy-out fund that gave the normally healthy-eating Japanese their guiltiest culinary pleasure: the Krispy Kreme doughnut.

Krispy Kreme, as any American knows, is a once much-hyped chain that makes some of the sweetest, most calorific deep-fried-dough around.

Confined to the US Deep South for most of its seven decades, the group went national in the 1990s, minted money with an IPO in 2000 and nearly

collapsed five years later due to reckless expansion and an Enron-esque reporting scandal.

The man who brushed aside this difficult history and brought Krispy Kreme to Japan is Tak Sawada, managing partner of Revamp, a retail consulting and management group whose other properties include the Japanese arms of Burger King and the Coldstone Creamery ice-cream chain.

Mr Sawada, who turned 50 last year but looks a few years younger, started his career young and selling chemicals at Itochu, one of Japan's big trading houses. He shifted to retail in the early 1990s when his employer sent him to the US to oversee its acquisition of the 7-Eleven convenience store group.

Hooked, he quit Itochu in 1997 to join a then little-known clothing business called Uniqlo.

"I started as a store manager because I wanted to learn the business from the bottom up," he recalls

in an interview at his small Tokyo office. Five years later, Uniqlo's revenues had grown by a factor of 10, its share price was up 65-fold and Mr Sawada was an executive.

Restless again, he next tried private equity, launching a retail-focused turnaround fund in 2003. It turned out to be a mistake: "I learned that I wasn't very good at managing money. I'd rather manage people and businesses." He and his partner pulled the plug two years later.

Mr Sawada had meanwhile discovered Krispy Kreme on a trip to California in 2002. Though the doughnuts were "delicious", it was the chain's "theatrical" marketing - with in-store doughnut machines that churn out warm treats as customers watch - that persuaded him to try to bring the brand to Japan. "It was a total concept. I had never seen that kind of business before in Japan," he says.

Krispy Kreme ignored Mr

Sawada's inquiries. "They were a little arrogant," he says. "They thought they could do anything. They wanted to beat McDonald's." Then came the sales slide, the accounting problems, the SEC investigation, the ousting of the chief executive and the emergency refinancing.

"[Consultants] told me to make the doughnuts less sweet... I ignored all of them"

"Suddenly, they were interested in me," he says. In partnership with Lotte, the Japanese-South Korean food company, Mr Sawada bought the right to bring Krispy Kreme to Japan.

That victory aside, Mr Sawada still had to persuade Japanese consumers to eat his product. His hired consultants were doubtful.

"They told me to make the doughnuts less sweet. They said no one would buy them by the dozen, because Japanese people travel on crowded subways. I ignored all of them." Keep the product authentic, he thought, and customers will follow. "Still," he says, "I was worried, to be honest."

He needn't have been. His first store, opened near Shinjuku station on the west side of Tokyo in 2006, was soon mobbed by customers. They lined up for hours and bought sugary Original Glazed doughnuts in US-rivalling volumes.

That initial hype has faded now, but queues still form at weekends and Mr Sawada says all his 12 outlets are profitable.

Looking back, Mr Sawada says buying a tarnished brand turned out to be a good move. The Japanese knew little of Krispy Kreme's troubles in the US, and "we could learn from their mistakes". American executives had

accelerated the company's expansion sharply after taking it public and started selling Krispy Kreme doughnuts everywhere from supermarkets to petrol stations - a strategy that siphoned sales from the company's own stores and degraded its "fresh baked" appeal.

Mr Sawada decided to move more carefully. His first branch outside Tokyo is set to open next month, in Nagoya. There are no sales outside Krispy Kreme's own outlets. "The key is to keep them fresh, keep them warm and make them on-site," he says.

Asked to advise others trying to crack Japan's notoriously difficult retail market, Mr Sawada is cautiously encouraging.

"Japanese consumers are very picky and there is a lot of competition, but you can succeed with the right product and the right management," he says.

"If you have energy, time and money, there are opportunities. If you are in a rush, don't try it."



Krispy Kreme opened its first Japanese outlet in 2006 Reuters

New model starts to take root Under-rated stocks show rich promise

Agriculture

Marketing is the key to success, writes Michiyo Nakamoto

When Hideki Shimazaki quit his job as a confectionery company salesman and joined his father-in-law's vegetable wholesale business, he had no idea he would end up pioneering a new style of farming in Japan.

Today, Mr Shimazaki is president of a successful agriculture corporation, with 35 employees and ¥1bn (\$11m) in sales.

The success of his company, Topriver, which grows and markets vegetables in Nagano prefecture, belies the widespread perception that domestic farming cannot be sustained without government protection to keep imports at bay, and subsidies to keep farmers afloat.

Yet the sector faces numerous problems. Most farmers own only very small plots of land, which makes farming costly and inefficient. Although regulations have been relaxed, until recently, consolidation was prevented by stringent rules on who was allowed to own farmland.

At the same time, a multi-layered distribution system coupled with persistent deflationary pressure means that many farmers are unable to make ends meet.

Farming's poor image has also discouraged young people from moving into the sector, so that an astonishing 70 per cent of farmers are aged 60 or over.

The Democratic Party government has even pledged to provide individual income guarantees to farmers, in a desperate attempt to revive agriculture and raise the country's food self-sufficiency from the current 40 per cent.

But far from the seats of political power, entrepreneurs such as Mr Shimazaki are proving that even in land-deprived Japan, farming can be profitable. "Agriculture today is not profitable because people persist with the methods of the past," Mr Shimazaki says.

"The world has changed, but farmers in Japan continue to produce what they have always produced and to sell their wares as they always have."

For one thing, most farmers first decide what to plant then try to sell their produce. "It's like trying to sell a Mercedes to someone who wants a pick-up truck," Mr Shimazaki says.

The practice also leaves them to the mercy of distributors, such as the powerful agricultural co-operatives, and robs them of any pricing power, he adds. What farmers need to do is bring a more market-oriented approach to their business.

While most farmers in Japan are happy to let the weather dictate their production volumes and the whims of the market determine their revenues, Mr Shimazaki's business model depends on aggressive marketing, pre-agreed sales and strict planning of production volumes.

Topriver's approach is to start with orders from its customers - which include include supermarkets, restaurants and food processing companies - and then produce vegetables to meet those orders. This allows it to plan production in advance and ensure stable revenues.

"In this era, even if you make good products, it doesn't mean



Breaking with tradition: farmers in Hokkaido need to think about potential customers as well as planting cabbages

you can sell them. Marketing and sales are twice as important as the products themselves," he says.

Topriver is one of an increasing number of success stories which are encouraging more people to turn their hand to agriculture. Nevertheless, those who have made the change can attest to the difficulties that remain.

For example, Hideaki Kato, who went from being a salaried worker in the information technology industry to farming strawberries, says it took him more than a year to win the trust of local farmers so that they would lease him land.

Mr Kato, who is keen to expand production, has been growing rice as well, even though it is not profitable.

Most farmers decide what to plant then try to sell their produce. 'It's like trying to sell a Mercedes to someone who wants a pick-up truck'

"Producing rice means you are trusted. I work in the rice field every day between 7 and 8 in the morning so that people will see me on their way to work or school and they will think I am a hard-working person," he says.

Many farmers, both new and experienced, also lack the management skills required to achieve the kind of success Topriver has enjoyed.

"Unless you can figure out what will sell, it is difficult to succeed," says Kinuko Yamamoto, senior managing director of Pasona, a human resources group.

Pasona provides training for those who want to become farmers as well as consultancy services to individuals and agriculture corporations.

The sector also needs to figure out ways to cut out the middle-man or how it can add value to products by processing them, in order to raise profitability, says Mitsuyasu Sato, who has been researching the agriculture sector at Nomura Research and Advisory.

Despite the many challenges, that remain, observers are generally optimistic that changes underway will transform the sector's prospects.

"There is an unprecedented number of companies looking at the agriculture sector and experimenting with various business models in an attempt to figure out what approach will succeed in making money," Mr Sato says.

"I think it is a turning point for Japanese farming."

Small companies

Now is the time to pick up a bargain, says Robin Harding

Propose an investment in Japanese equities to most global fund managers and their response might be, at best, a weary sigh. There have been many false dawns since the 1989 peak in the Nikkei index, and many fortunes lost by investors trying to call the bottom. So cynicism runs deep.

Propose an investment in small-capitalisation Japanese equities - which are illiquid, little researched and often family-dominated - and a fund manager may question your sanity.

Investors who ignore these small caps, however, are ignoring a group of companies that, on some measures, are among the cheapest in the world. In particular, Japan's small-cap market abounds with companies valued at a deep discount to their assets - the kind that first made famed counter-cyclical investor Warren Buffett rich.

Consider Katsuragawa Electric, a maker of wide-format printers and plotters with sales of about \$200m. Like many fellow exporters, Katsuragawa has fallen into loss during the downturn, and printers are subject to rapid technological change, although its makers belong to something that is far from a sunset industry.

Katsuragawa has ¥5bn (\$55m) of net cash on its balance sheet, total net assets of ¥17.3bn, and at the recent peak in 2007 it made a net profit of ¥1.6bn. Yet the valuation of the whole company on the Jsdq stock exchange is ¥3.6bn.

In other words, for every ¥100 investors put into Katsuragawa shares they get ¥139 in net cash and ¥481 in net assets, while paying only a little over twice the company's peak earnings.

Katsuragawa is towards the extreme, but the whole market is similarly rich in assets. "More than 60 per cent of companies are trading at under book value," says Masaki Motomura, small-cap strategist at Nomura Securities.

Nor are all of these seemingly cheap companies that small. The musical instrument maker Roland has also fallen into losses, but has sales of more than \$1bn, plenty of net cash, and trades at 0.36 times its book value. It would be easy to assemble a portfolio of globally competitive Japanese manufacturing stocks for less than the value of their assets.

"Of course there is a reason why Japan's small-caps are trading at such low valuations: their return on equity is among the lowest in global markets," Mr Motomura says.

Nomura estimates the return on equity of small-caps this year to be 4.7 per cent, compared with 6.6 per cent for all Japanese companies and 13.4 per cent for all stocks in the developed world.

Mr Motomura sees a cyclical opportunity to buy Japanese small-caps: with a recovery in earnings over the next couple of years, return on equity might rise to 7 per cent, which could

justify a rally in share prices of more than 50 per cent to stay in line with other stock markets.

"Foreign investors only became positive again last November," Mr Motomura says. He expects them to concentrate on large stocks for the first half of the year, so he does not expect small-caps to outperform until the second half of the year. But he urges investors to start buying now.

From another point of view, low return on equity is attractive in itself, because it means there is room to improve.

Whereas investors in highly valued stock markets such as the US are dependent on earnings growth to push their shares ever upward - at a time when their profit margins are already high by historic standards - investors in Japanese small-caps merely need companies to start using their balance sheets more efficiently.

That will require a change of attitude amongst Japanese managers. Efforts by activist shareholders to force such change have largely failed: campaigns by Steel Partners, a US activist fund, for greater asset efficiency at small companies from Bull-Dog Sauce to the brewer Sapporo Holdings have, for the most part, been energetically blocked by corporate managers.

Many Japanese small caps



'More than 60 per cent of companies are trading at under book value'

Masaki Motomura, Nomura Securities

still seem to view their shareholders as a nuisance who, ideally, should be neither seen nor heard.

Poor results from the confrontational approach, however, do hide a gradual change.

In 1992 only 12.1 per cent of small Japanese companies bothered with investor relations meetings, for example, but by 2007 that percentage had risen to 63.7 per cent according to a Nomura analysis based on data from the Commercial Law Review.

At a national level, efforts are under way to improve minority shareholder rights and corporate governance, by requiring independent non-executive directors for example. Such changes will affect small companies as well as large.

Still, Mr Motomura's advice is to concentrate on either the highest-quality Japanese small-cap companies or those that fit a particular investment theme, rather than those that simply appear the cheapest.

He suggests shares that will benefit from efforts to cut greenhouse gas emissions such as Yamatake - which makes components to regulate air conditioners - and Okano Valve, which should benefit from the construction of new nuclear power plants.

Aviation policy starts to spread its wings

Airports

Steps are at last being taken to meet expected demand, reports Jonathan Soble

When Japan Airlines filed for bankruptcy protection last month, many blamed the government's passion for building airports.

Japan has nearly 100 fully fledged civilian facilities – too many, critics say, for a mid-sized country with a shrinking rural population, world-beating inter-city rail and next to no private aviation.

Operating near-empty flights to obscure destinations cost JAL billions of yen over the years, yet managers held off cutting routes for fear of angering officials in Tokyo.

Now Japan's Democratic Party government – elected last year and currently supporting JAL's revival effort with ¥900bn of taxpayers' money – has promised big changes to aviation policies. The benefits could radiate well beyond JAL, with foreign visitors expected to be among the winners.

The crux of the shift is a renewed focus on the greater Tokyo area, home to some 35m people, or more than a quarter of Japan's population, and the country's primary international gateway. The capital has for

years seen its air links neglected, even as those of rural precincts flourished. By common consensus it has fallen behind other big Asian cities such as Hong Kong and Shanghai.

Some of Tokyo's flaws have long been obvious to travellers. Narita, its international airport, sits amid rice fields 60km north-east of the city. First-time visitors expecting to be whisked to their hotels by high-speed bullet train are inevitably let down: the distinctly un-bullet-like shuttle takes an hour to reach Tokyo station, just south of the central Imperial Palace, and a full 90 minutes to get to Shinjuku, the teeming business and entertainment

The expanded Haneda is likely to take over from Narita as the main international hub

district on the west side of town.

Catching a domestic connection is no more convenient. A three-decade-old policy allocates virtually all international traffic to Narita and most local flights to Haneda, the older, larger airport nearer the city centre. Getting from one to the other means a 75 minute bus ride or a longer, multi-transfer trek on the trains.

It is little wonder that many Japanese living outside Tokyo have given up using the capital as an

international hub. Many now fly from regional airports to Seoul and catch onward flights from there – to the benefit of South Korean carriers and the loss of JAL and All Nippon Airways, Japan's second-largest airline.

Access is only part of Tokyo's airport problem. Narita and Haneda are too small to meet demand, which is growing, as Asian countries become richer and send more tourists and business people to Japan. The number of visitors to the country rose 60 per cent to more than 8m between 2002 and 2008, in spite of the fact that many foreign carriers were shut out of Narita for lack of landing slots.

According to a study published last year by the Nippon Foundation, a think-tank, the combined demand at Narita and Haneda could grow from 100m passengers a year today to 170m in 2030. International traffic is projected to account for 110m of the total, three times the present level.

The situation is due to improve somewhat over the coming year. Beginning in March, Narita's capacity will increase by 10 per cent, or 20,000 take-offs and landings a year, following extension work on one of its two runways.

A faster train link is also close to completion. Its operator says it will shorten the journey to the eastern edge of the city centre to 36 minutes, though most passengers will have to transfer from there to reach their final destinations.

Haneda is receiving a more extensive boost, with the addition of a fourth runway, set to open provisionally in October and to be in full operation by March 2011. Built by extending the seaside airport further into Tokyo bay, the runway will boost Haneda's capacity by a third, from 303,000 flights a year to 407,000. Crucially, half the new slots are to be allotted to international flights.

The expansion projects at both airports were approved by the previous, Liberal Democratic administration. But the new government is planning a more radical rethink of Tokyo's airport set-up. Seiji Maehara, transportation minister, has promised to scrap Narita's monopoly on international flights and to turn Haneda into Japan's dominant aviation hub.

Previous efforts to internationalise Haneda had run into fierce resistance from transportation bureaucrats, whose commitment to Narita is rooted in the long and sometimes bloody struggle to build it. In the 1970s, leftists and local farmers, angered by what they saw as the government's heavy-handed appropriation of land for the project, fought pitched battles with police over its construction.

However, lingering local resistance to the airport – a few taxiways still veer around farmhouses owned by the most stubborn hold-outs – makes it impossible to expand very much.

Haneda was already absorbing some of the over-



Grounded: Japan Airlines' bankruptcy may prove the catalyst for much needed reforms in the country's flight network AP

flow, with flights to South Korea, Taiwan, Hong Kong and parts of mainland China permitted in recent years, although the transport ministry set rules designed to preserve Haneda's domestic status.

International flights are classed as special charters, can only operate during off-peak hours and have been restricted to destinations within 2,000km of Tokyo – equivalent to the most distant domestic airport.

It is this sort of pretence that Mr Maehara has promised to end.

Motoshige Itoh, an economics professor at the University of Tokyo who has studied Japan's aviation policies, says the change could pave the way for even larger-scale expansion, including the addition of a fifth runway that he believes could boost capacity to 683,000 flights a year. "That would bring us close to meeting the

expected growth in demand," he says.

Some obstacles remain. JAL executives worry that a shift to Haneda would further handicap the carrier against ANA, which began life as a domestic-only carrier and has better infrastructure at Haneda.

American carriers, such as United and Delta, worry that splitting international traffic between two airports would jeopardise their regional connections and

dilute the benefits of the recent "open skies" deregulation deal between Tokyo and Washington.

Incumbent airlines fear creating room for low-cost regional carriers such as Malaysia-based Air Asia, which could drive down fares.

Despite these hurdles, the day when stepping off a flight in Tokyo feels as smoothly efficient as riding a bullet train is looking a little closer.

In-wheel motors increase speed as well as range

Automobiles

Electric vehicles are looking more like realistic alternatives, says Jonathan Soble

If you had asked a child in the 1950s to draw a "car of the future", the crayoned result might well have resembled the Eliica. With eight wheels and a swoop-backed silver body, the vehicle – built in 2004 by students at Tokyo's Keio University – looks like someone's retro space-age fantasy.

It goes like a rocket too. Tests conducted by SIM-Drive, the company set up by Keio and a group of investors to commercialise the Eliica's underlying technology, put its top speed at 370kmph (230mph) – faster than the most asphalt-roasting Ferrari. Racing on a drag strip against a Porsche 911, in a contest that can be watched on YouTube, the Eliica pips the German roadster, accelerating to 100km/h from a standing start in just 4.1 seconds.

These achievements will give heart to supporters of battery-powered electric vehicles, for that is what the Eliica is. The machine runs on rechargeable lithium-ion batteries like those that are to power Nissan's upcoming Leaf family hatchback as well as "plug-in" petrol-electric hybrids being put into production by carmakers around the world.

The Eliica's blistering speed should help dispel the widely held image of electric vehicles

as underpowered. Its range, meanwhile, addresses an even bigger concern, one that has kept most mainstream carmakers from committing aggressively to the technology.

According to SIM-Drive, the Eliica can be driven 300km on a single charge – about twice as far as the Leaf and nearly half the range of many petrol cars. "So far, electric vehicles have been designed just like petrol-powered ones, except that the engine is replaced by an electric motor," says Hiroshi Shimizu, a professor at Keio who is chief executive of SIM-Drive. "That means the full possibilities of electric vehicles haven't been exploited."

The main difference between Mr Shimizu's design and that of

Instead of a centrally located motor, the Eliica has a small one mounted behind each of its eight wheels

a "conventional" electric car is that instead of using a single, centrally located motor, the Eliica has a smaller one mounted behind each of its eight wheels. Mr Shimizu likens the configuration to the networks of desktop PCs that have largely replaced bulky mainframes.

As the Eliica's motors drive its wheels directly, there is none of the energy loss that occurs when power from a single engine is transmitted via gears, driveshafts and axles to multiple wheels. Eliminating the



Stranger than fantasy: the eight-wheel-drive Eliica APF

Eliica's transmission system makes it 30 to 50 per cent more efficient than other electric cars, according to Mr Shimizu.

Of course, the design may be a bit eccentric for the average driver. But Mr Shimizu believes he can build a more conventional looking four-wheel, five-passenger electric car with an identical 300km range, if not the explosive speed of the eight-wheeler.

What is more, he says such a car could be mass-produced cheaply enough for its manufacturer to earn a profit selling it for just ¥1.5m (\$16,500), excluding the battery. "At that price the economic value becomes clear for consumers," he says.

"In-wheel" motors are not new. They were used in some of the earliest automobiles, including an electric one designed by Ferdinand Porsche and displayed at the Paris World's Fair in 1900. But they fell out of fashion when petrol emerged as the standard power source for the automobile a decade or so later.

Mr Shimizu's investors, a collection of 34 carmakers, electric power companies and others, think there is enough potential for a revival to have invested ¥680m in SIM-Drive so far, and a vehicle based on the Eliica may go on sale in 2013.

Big manufacturers are also refining the technology on their own. "Our engineers are driving

them around test tracks right now," says Takeshi Uchiyama, the head of product development at Toyota.

Not everyone thinks in-wheel motors will be the next big thing. Some engineers say that, while simplifying the drivetrain, they adversely affect handling by adding unsprung weight.

Yet SIM-Drive's project highlights some fundamental implications of the nascent shift to electric power that could drastically change the way cars look, feel and drive. Other Japanese car designers are also turning out impossible-looking prototypes, such as Nissan's ultranarrow, tilting Land Glider, which sports two motors, one each on its front and rear axles.

Other electric cars will have more room for passengers and luggage, Mr Shimizu says. The Eliica and the cars that will succeed it are "platforms" in the literal sense: slabs of steel with batteries sandwiched between them and motor-wheels stuck to the side. Any frame could be mounted on top, including salvaged classic cars. Drivers could swap when they get bored, like teenagers sticking new plastic covers on their mobile phones.

"All the important parts for driving the car are in what has until now been dead space," Mr Shimizu says. "That frees you to do whatever you want in terms of design."

Lithium-ion technology is now the limiting factor

Batteries

A breakthrough in research is needed, says Robin Harding

A dream of inventors in the 19th century was the steam-powered aircraft, but none succeeded because steam engines were simply too heavy.

Now a modern-day dream – the electric car – faces a similar threat. Their range is limited by lithium-ion batteries that cannot store enough energy relative to their weight, and that has sent both companies and scientists on a technological quest.

Leading electronics companies with decades of battery expertise, chemical companies strong in battery materials, and carmakers that have long focused on fuel efficiency make Japan a leader in this race.

Most of the companies are working to improve existing lithium-ion batteries and get electric vehicles on the road. At the same time, however, some scientists and corporations are in pursuit of what is sometimes called the "ultimate battery" – which would use a combination of lithium and air.

NEC has formed a joint venture with Nissan to supply the lithium-ion batteries for its Leaf electric vehicle. "By modifying the materials, I think we can improve the energy density of our batteries by 20 or 30 per cent," says Takemitsu Kunio, who leads the company's research and development.

To increase the capacity of a battery by a factor of two or more, Mr Kunio says, new materials may be needed. The trouble is that it may take at least a doubling of capacity to produce an electric car that can compete head-to-head with petrol.

A kilogram of petrol contains about 13,000 watt-hours of chemical energy – of which about 4,500 watt-hours might be captured by an internal combustion engine. But a kilogram of today's lithium-ion battery stores only 100 watt-hours of electricity. Cost apart, for the same amount of energy, today's lithium-ion batteries are 45 times heavier (and 16 times bigger) than petrol.

The result is doubt about whether consumers will buy them. Mitsuru Homma, who as head of Sanyo Electric's world-leading lithium-ion battery business has everything to gain from their success, said recently that for full electric vehicles "we need a breakthrough".

That breakthrough will not come by waiting for lithium-ion

'A lithium-air battery could achieve an energy density of 10 times that of lithium-ion'

batteries to improve, and for two reasons. First, batteries follow the rules of chemistry rather than the rules that have allowed computer processing power to double every two years. It has taken almost 15 years for the capacity of Sanyo's consumer lithium-ion batteries to double.

Second, even if lithium-ion makes rapid progress, the theoretical upper limit on the chemistry is between 400-500 watt-hours per kg – still only a 10th of petrol – and the practical limit is likely to be much lower.

What is needed is an all-new battery chemistry – and the most exciting possibility is lithium-air, which in theory could

match the storage capacity of gasoline.

"A lithium-air battery could achieve an energy density 10 times that of lithium-ion, which would let a car travel hundreds of miles between charges," said Dr Haoshen Zhou, a researcher in the field at Japan's National Institute of Advanced Industrial Science and Technology.

Dr Zhou and other research groups have lithium-air cells working in the lab but there are fundamental problems still to resolve. The batteries made by Dr Zhou, for example, contain a thin sheet of glass that conducts lithium ions but prevents anything else getting through to react with the lithium metal.

The material, developed by Japanese glassmaker Ohara, is fine in the lab but, put such batteries in a car, and the glass would break. Battery makers could use a thicker and stronger sheet of glass but then its conductivity would be insufficient.

Ohara has been making further advances in its lithium-ion conducting glass, but to get to the levels of conductivity needed to make a durable, lithium-air car battery "we will still need a breakthrough", says Kosuke Nakajima, head of new business promotion for Ohara.

For that reason Dr Zhou says that he expects alternatives such as lithium-copper rechargeable batteries – a step up from lithium-ion although no match for lithium-air – to appear first. He estimates that lithium-copper could be commercialised in three to five years.

It takes a long time to prove a battery's safety and put it into mass production, however, and companies such as NEC, Sanyo Electric, Panasonic and Toshiba are still putting much of their effort into lithium-ion.

Whether that is an error will soon become clear.

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Investing in Japan

Leaders in innovation are feeling the pressure

Design

Competition is increasing, writes Robin Harding

From fashion to graphics, and architecture to furniture, the minimalist approach of Japanese designers, with its roots in traditional culture, has become popular around the world.

"While neighbouring countries – Korea, Taiwan, Singapore and China, among them – have been working to emulate this success, in the early 21st century, Japan still leads the way, producing some of the world's most innovative designers and design," writes Penny Sparke in *Japanese Design*, a recent book published by the Museum of Modern Art in New York.

The success of Japanese design has been intertwined with the success of Japanese industry. Attractive design helped gadget makers such as Sony and Panasonic to grow, but now that Japan's exporters are suffering from Korean and Chinese competition, the country's designers are struggling to make sure that the look of products remains a priority.

Kazuya Shimokawa, the editor of *Nikkei Design* magazine, points to the number of applications to register a design with the Japan Patent Office. In 2004 there were 40,756; by 2008 that had fallen to 33,569. "Independent designers and design firms are under a lot of pressure," Mr Shimokawa says.

Chiaki Murata runs his own

studio, Hers Design Laboratory, tucked away in a suburb of Osaka. Among his many credits is work on the external design of Microsoft's Xbox 360 games console, helping create its hour-glass shape, and arranging the machine's indicator lights into a segmented ring.

His client on that occasion wanted some Japanese spirit in its product but was concerned it could go too far. "With a Japanese designer, it can become too simple. The trick is to pare it down and pare it down but to keep the essence," says Mr Murata.

"I think I can say that – until now – Japanese electronic design and product design has led the world and made products that are globally competitive."

That, he fears, is changing, as electronics groups not only move their factories abroad but struggle to make money wherever products are made.

"Various electronics manufacturers think that bought in design is expensive, so they are moving as much work as possible inhouse. But their inhouse potential is low, so their design just becomes more conservative," says Mr Murata. He blames that trend for a deterioration in Japanese success at the iF design show in Germany.

Makoto Shimba has seen both sides: having spent seven years as an inhouse designer for Sharp, he now runs his own studio, SIM Design in Tokyo.

"Inhouse, the scope of a design is predetermined... so coming at something from a completely different point of view is difficult," Mr Shimba says. "A lot of [inhouse] design-



New tricks: attractive products, such as this Sony robot dog, have helped gadget makers to prosper

AFP

ers are making the same kind of product again and again, which is very cost-efficient as they get used to it, but their minds become fixed," he says, which reduces creativity.

Corporations doing more design inhouse may be bad for independent designers and for overall creativity but it has brought on new talent.

The standard career path for a Japanese industrial designer is to graduate from one of Japan's many design universities or colleges, then enter a big company, after which the most talented may eventually strike out on their own.

That experience in a big com-

pany, close to the realities of manufacturing, marketing and engineering, can give Japanese designers practical experience that their counterparts abroad, who go straight into independent studios, may lack.

With the giants of Japanese industry no longer certain to supply a steady stream of work, however, designers are being forced to look in different directions.

Mr Murata's studio has created its own design brand – Metaphys – and now works with a large number of manufacturing partners to create and distribute products.

Mr Shimokawa points to a

number of options for Japanese designers. One way, he suggests is to look for growth areas, such as medical devices, which may not have paid enough attention to design in the past.

Another is to consider the needs of the developing world. A third is to export the designs themselves – working more for foreign manufacturers – rather than simply designing Japanese products.

Mr Shimokawa says that Japanese designers are aiming for ecology, usability and a combination of cutting-edge technology with traditional crafts and ways of living.

"I think that can continue to

gain sympathy outside Japan," he says.

As an example of a recent piece of Japanese design that achieves some of these qualities he points to the plastic bottle for I Lohas, a brand of mineral water made by Coca-Cola Japan.

Advances in plastics mean that bottles can be made very thin – which reduces waste – but consumers have been reluctant to accept them.

The I Lohas bottle can be easily crumpled into a small sheet when empty, making it easy to carry or throw away, and turning the thin plastic walls into a consumer benefit.

'Various electrical manufacturers think that external design is expensive'

Chiaki Murata, Hers Design Laboratory

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Skunk-like grape gives hope that dreams may bear fruit

Winemaking

Vineyards have many obstacles to overcome, writes Michiyo Nakamoto

Takayoshi Kano walks briskly along a narrow path covered in moss, past a neighbour's field, as he makes his way to a modestly sized plot filled with chardonnay grape vines.

It is a mild, winter day, the vines have all been neatly trimmed and the smell of burning leaves wafts through the air as Mr Kano describes the challenges he faces as head of production at Marufuji Winery, in Katsunuma, Yamanashi, the heart of Japan's wine country.

"The vines in this plot are grown in the hedgerow style, which allows us to cover the grapes with plastic during the rainy season. But if it doesn't rain much, the grapes get musty under the plastic. Sometimes, we cover the grapes with paper umbrellas," Mr Kano says, surveying the patchwork of diverse vineyards clustered close to each other.

Mr Kano is one of hundreds of wine growers grappling with the challenges of producing a quality product in hostile conditions.

Wine has become a popular drink in Japan, whose devotion to fine food and drink means that the number of Michelin stars its restaurants boast exceeds that of Paris and London combined.

However, producing wine in this mountainous island country with its wet climate is a feat that would discourage all but the most determined of enthusiasts.

Winegrowers on the main island of Honshu have a humid climate that is conducive to mildew and rot, as well as typhoons that lash the fields just before the autumn harvest.

What is more, most parts of the country lack the temperature swings between day and night that help produce the flavours

that define a good wine.

"Japan has a wet climate, with hot days and hot nights [in summer], so you're at just a phenomenal disadvantage," says William Campbell, owner of Hotei Wines, an importer of premium wines based in Tokyo.

Added to those problems are the high cost of fertile land, and a historical tendency towards small land holdings. This means that the average vineyard is just a fraction of a hectare.

No wonder, then, that until recently "wine was very, very expensive and mostly what people gave each other as gifts", says Bruce Gutlove, a winemaker from California who has been producing wine in Japan since 1989.

It is only in the past decade or two, as better-travelled consumers developed a more sophisticated appreciation of the drink, that domestic producers became serious about improving quality.

They are now experimenting with new techniques

and honing their skills in the hope that one day their output will find a place among the world's greatest wines.

Shigekazu Misawa, managing director of Chuo Budoshu, one of Katsunuma's leading wineries, is among those spearheading a drive to raise quality and develop global markets.

'To reach the top 50 of global wines may be a dream. But we have to make efforts for 50 to 100 years'

Efforts are focused on koshu, a pink grape that has been grown in Japan for more than 1,000 years. It makes a light, dry white, and is considered the grape best-suited to the humid climate.

"Koshu wine is known to be good with Japanese food, which is experiencing a boom overseas," says Sho-

mei Yokouchi, governor of Yamanashi, who has been an avid supporter of Katsunuma's efforts to win international recognition.

Mr Misawa and the governor recently led a marketing effort in London, where representatives of 15 wineries hosted tastings of koshu wine.

While Mr Misawa is pleased with the reaction to the wine in the UK, he is under no illusion that the quality of wines made with koshu grapes still pales in comparison with the great white wines of the world, made from such grapes as chardonnay, sauvignon blanc and semillon.

"To reach the top 50 [of global wines] may be a dream. But we have to make efforts for 50 to 100 years," Mr Misawa says.

A big problem is that koshu has a natural mould repellent, which is what makes it suitable for the climate. But this also means that "the skin has a bitter, nasty taste", says Mr Campbell.

"In effect, it's kind of like a skunk – it's a difficult grape to work with."

Nevertheless, hopes are rising that the wine growers' efforts will eventually bear fruit.

There is a trend for wine makers to move away from imitating western techniques towards developing a distinctly Japanese wine.

"I think we have shifted gears," says Mr Gutlove.

Early winemakers relied on techniques and equipment that were brought over from Europe, only to find that they were not successful with those techniques because of the substantial differences in the climate.

"Now we have the next generation, which understands that what needs to come out of Japan needs to be uniquely Japanese because it has to be reflective of the climate," he says.

"It's going to be a long process. But it's the most exciting thing to think about – because that is what is going to make Japanese wine unique."



Koshu is the grape best-suited to the humid climate

Alamy