Public Economy, Part 2

Taxes

11

This chapter describes the tax system of Japan and recent attempts to change it. The government of any nation must depend upon taxes to sustain its activities. An ideal tax system is one that entails the smallest possible economic burden given the scale of government expenditures, and that distributes that burden among the nation's citizens in a politically acceptable way. The tax system of Japan is certainly not ideal, but is much improved over those of ages gone by.

Economists have known since the nineteenth century that the least burdensome tax is a lump sum collected from each citizen. But a tax system limited to lump sum taxes would surely incite political protest. Few would favor a tax system that burdened the rich and the poor alike with no consideration of individual differences. But what is politically acceptable in one time and place may not be in another. In the Edo period the Japanese peasants paid a portion of each year's rice harvest in taxes while many of the samurai paid no taxes at all and in fact received hereditary stipends. This sort of arrangement would never have come about in a democracy but the *baku-han* government system of the Edo period was not at all democratic.

Japan today, like most developed countries, has a tax system that is progressive on income. That is, those with higher incomes tend to pay larger fractions of their incomes in taxes. The tax progressivity resides mainly in Japan's personal and corporate income taxes. But in the last twenty years Japan has begun a long-term change in its tax system to rely more on a broad-based consumption tax. This has been defended as distributing the tax burden of Japan's expanding government spending in a way that is equitable and efficient.

Taxes are never far from any discussion of the economic effects of government policies. Indeed, a complete economic analysis of any policy requires some statement about the new taxes that all expenditures of public resources inevitably entail. Governments, like individuals and businesses, can borrow to cover current expenditures, shifting some of the tax burden to the future, even shifting it on to generations of taxpayers yet unborn. The proper distribution of taxes across the years is thus a major focus of both political and economic analysis of tax systems. In the last dozen years the government of Japan has taken on enormous debt. Is this policy sustainable? And is it wise? As elsewhere in this volume, we start with the basics.

Taxes in Japan

Meiji era and early twentieth century

Table 11.1 describes the basic sources of tax revenue in Japan from 1886 to 1945, and their scale in relation to GNP. From the late nineteenth century through 1945, Japan's tax system resembled those of developing countries of today. It had a narrow base and included revenue sources now largely eschewed by the developed countries, such as inflation of the currency, customs duties, and the operation of government monopolies. In prewar Japan, as in the developing countries of

Table 11.1. Taxes in Japan, 1886 to 1945
Units = percent GNP

fy	total	local taxes	national taxes (other than profit and seigniorage)	land tax	personal income tax	business enterprise tax and corporate income tax	excise taxes	customs duties	profit from government enterprise	seigniorage
1886	11.9	3.9	8.2	5.4			1.5	0.4	0.2	−0.4
1890	11.8	2.9	6.6	3.8	0.1	0.0	1.3	0.4	0.2	2.1
1895	10.3	2.5	5.4	2.5	0.1	0.0	1.1	0.4	0.2	2.2
1900	9.6	3.7	6.4	1.9	0.2	0.3	2.1	0.7	0.3	−0.7
1905	15.7	3.0	10.2	2.6	0.5	0.9	2.3	1.2	1.1	1.4
1910	17.9	4.3	10.4	1.9	0.6	0.8	2.7	1.0	1.6	1.7
1915	14.4	3.8	8.3	1.5	0.5	0.7	2.2	0.6	1.4	1.0
1920	9.1	3.6	5.7	0.5	0.4	1.2	1.3	0.4	0.8	−0.9
1925	11.7	4.0	7.0	0.5	0.9	0.9	1.9	0.7	0.9	−0.2
1930	11.5	4.2	7.5	0.5	0.9	0.8	2.2	0.7	1.3	−1.6
1935	11.8	3.5	6.6	0.3	0.7	0.8	1.8	0.8	1.1	0.7
1940	18.0	2.1	11.2	0.1	4.0	0.8	1.7	0.4	1.0	3.7
1945	31.3	1.3	15.5	0.0	5.1	1.7	2.5	0.0	1.4	13.1

Sources: national taxes: Miwa Ryoichi and Hara Akira, eds., *Kindai nihon keizai shi yoran* (Handbook of the economic history of modern Japan), revised edition, 2010, Table 27, p. 21; *profit from government enterprise*: Miwa and Hara, Table 25, p. 20; *local taxes*: K(azushi) Ohkawa and M(iyohei) Shinohara (with Larry Miesner), eds., *Patterns of Japanese Economic Development: A Quantitative Appraisal*, Yale University Press, 1979, table A46, pp. 376–7; *GNP*: Miwa and Hara Table 1, pp. 2–3, (last row based on 1944 GNP from SNA); *seigniorage*: computed from annual change in currency issued, Miwa and Hara, Table 1, col. 15, pp. 4–5.

today, much economic activity was conducted on a cash basis, leaving no banking records that could be scrutinized by tax collectors. The base for taxation was limited to the economic items that were recorded (land ownership), or that did benefit significantly from involvement by banks (transactions by large scale businesses, international trade). The difficulty of collecting taxes in a country with a limited financial system inhibited the expansion of Japan's public sector, which partly accounts for the small scale of Japan's public sector in the prewar era compared to today. It also explains why the Imperial Japanese government relied upon the sources of revenue that it did, rather than levying more broadly-based, less distortionary taxes. These same considerations pertain to the tax systems of developing countries today.[1]

From 1873 the Meiji government taxed land, an evolutionary step that replaced the rice taxes on which the *baku-han* system had heavily relied. A tax on liquor introduced in 1896 was a further major source of government revenue, ultimately surpassing the land tax in size. To finance military spending in the years before the Russo-Japanese War, the Meiji government introduced a sugar tax in 1901, and in 1904 a tax on oil and on cloth. From 1904–05 it operated tobacco and salt businesses as government monopolies, so that their product prices included an implicit tax that was difficult to evade. Japan introduced personal income taxes in 1888, but the tax rates were low by modern standards and only applied to the highest incomes. A business enterprise tax (based on capital assets and number of employees) was introduced in 1900. In 1940 a corporate income tax was brought in, as was a general consumption tax. Customs duties were limited by international

[1] Gordon and Li describe the difficulties in designing a tax system when the informal sector of the economy is large and argue that these difficulties are the reason for some otherwise puzzling features of the actual tax systems of developing countries. Roger Gordon and Wei Li, "Tax Structures in Developing Countries: Many Puzzles and a Possible Explanation," *Journal of Public Economics*, 2009, vol. 93(7–8), pp. 855–866.

treaty until 1911, but ultimately accounted for around five per cent of general government revenue during the prewar era. Local, mainly prefectural, taxes were mostly on property and surtaxes on the national taxes. Local tax revenue was around one third as great as national tax revenue throughout the pre-war period.

Inflation of the currency was an additional vehicle for taxing Japanese citizens, particularly in the years of the Pacific War 1940–1945. The government, as the sole supplier of the nation's currency, enjoys a stream of revenue from expansion of that currency, called seigniorage. The currency that confers seigniorage is the monetary base, which includes the vault cash of banks and the currency held by the public. The base does not include bank deposits which are a component of the money stock created by fractional reserve banks, not by the government. When the government acquires goods and services using newly minted or printed currency it expands the monetary base. Each such expansion of the monetary base confers seigniorage equal to the value of resources so acquired. As the economy grows people naturally wish to hold more of their wealth as money and the government can expand the monetary base to accommodate this without causing inflation of prices. But by expanding the monetary base beyond the rate consonant with stable prices, the government can obtain still more seigniorage, and this is true even if the price inflation it causes is fully anticipated. A government that expands the rate of growth of the money base could be described as levying an inflation tax, as the inflation-caused erosion of exchange value of base money just equals the increased amount of seigniorage beyond that consonant with stable prices. There is an upper limit on this inflation tax which is reached when the increase in rate of expansion of the currency causes an even greater increase in the rate of inflation of prices.[2] At that point the government is printing more money but obtaining fewer real goods in exchange for it. This happens when high inflation motivates people to shed their own money holdings, and so exchange their money for goods, in the end pushing up the prices of goods even faster. After 1936, in Japan seigniorage comprised an increasing portion of taxes. And by the end of the war in 1945 the inflation rate was so high that real seigniorage may have reached its upper limit as just described.

Military conscription is a tax on labor payable in kind, not included in the government accounts. In 1873 Japan introduced a military draft requiring all men from 17 to 40 years in age to serve three years in active duty, followed by two more years in active reserve and another two more in standby reserve. The tax burden of conscription is the difference between wages actually paid to draftees and the wages that would have been needed to induce their voluntary service. This was possibly quite large in relation to other taxes in Imperial Japan.

The connections between taxes, military spending and politics are many. S(hinju) Fujihara[3] draws our attention to the political considerations that bore on each expansion of the taxes needed to finance Japanese military adventures opposed by a majority of the citizenry. Broadening the political franchise strengthens the tax capacity of a government but also deters any profligate use of government resources not supported by the citizenry. The military governments that led Japan to war from 1931 to 1945 may have calculated that commandeering resources and inflating the currency were the only ways to pursue their war strategy. Imposing a broader set of taxes would have required a wide political consensus that might have brought in more revenue but also would have constrained the government's capacity to wage war.

The current tax system[4]

The current tax system of Japan evolved from the tax system adopted in 1950 during the American occupation, based on the advice of a US advisory

[2] For an algebraic analysis of the bounds on seigniorage refer to David Romer, *Advanced Macroeconomics*, Fourth Edition, 2012, Chapter 11, pp. 567–76. McGraw-Hill, New York.

[3] Shinju Fujihara, "Financing Warfare: Lesson from Imperial Japan," USJP Occasional Paper 03-03, 2003.

[4] For a short summary of the main taxes and tax rates in Japan, the following is excellent: Japan Federation of Certified Public Accountants' Associations, "Guide to Japanese Taxes 2012," http://www.nichizeiren.or.jp/eng/pdf/GuidetoJapaneseTaxes2012.pdf.

For more detail consult: Tax Bureau, Ministry of Finance, *Comprehensive Handbook of Japanese Taxes 2010*.

Table 11.2. Taxes in Japan, 1950 to 2009
Units = percent GDP

f.y.	Total	Social security wage taxes	Sub Total	Personal income taxes	Corporate income taxes	Fixed asset taxes	Inheritance and gift taxes	General consumption taxes	Specific consumption taxes	Other
1950	20.3	1.0	19.2	5.6	2.1	0.0	0.1		2.9	3.9
1955	16.7	1.4	15.3	3.2	2.2	0.0	0.1		2.2	3.2
1960	19.0	3.8	15.3	2.4	3.5	0.0	0.1		2.1	2.9
1965	18.4	4.1	14.3	2.9	2.7	0.0	0.1		1.8	2.2
1970	19.6	4.3	15.3	3.5	3.6	0.1	0.2		1.5	2.3
1975	21.1	6.2	14.9	5.5	3.7	1.0	0.2		1.1	3.3
1980	25.6	7.6	18.0	6.9	4.8	1.2	0.2		1.4	3.6
1985	27.8	8.5	19.3	7.7	4.9	1.4	0.3		1.6	3.3
1990	30.9	9.0	21.9	9.3	5.7	1.4	0.4	1.1	2.3	1.8
1995	28.6	10.5	18.1	6.7	3.7	2.1	0.5	1.2	2.4	1.4
2000	28.0	10.8	17.3	6.2	3.1	2.1	0.3	2.4	2.3	0.9
2005	28.1	10.8	17.2	5.4	3.6	2.1	0.3	2.1	2.2	1.5
2009	27.6	11.7	15.9	5.9	2.1	1.9	0.3	2.1	2.1	1.6

Source: Constructed by the author from the following:

GDP: Cabinet office, SNA. *Local taxes before 1975*: Hayashi Takehisa, Imai Katsuhito, and Kanazawa Fumio, eds., *Nihon zaisei yoran* (public finance in Japan historical statistics), 5th edn., 2001, table 26, p. 87. *All others*: Statistics Bureau, Government of Japan, *Historical Statistics of Japan*, 5–6 National Taxes by Principal Item (F.Y.1927–2004), and table 5–14 Local Tax Revenue by Tax Item (F.Y.1975–2002), and corresponding tables in *Japan Statistical Yearbook*, annual.

committee headed by Columbia University economist Carl Shoup.[5] The Shoup mission recommended that Japan adopt a comprehensive and progressive income tax, eliminate sales taxes, and allow local governments more autonomy in setting taxes, particularly property taxes. It recommended that corporate taxes should be maintained only to forestall evasion of the personal income tax.

Japan and the other developed countries now rely more on income and wage taxes than on consumption or property taxes. As shown in Table 11.2, for Japan wage taxes are now the largest single source of tax revenue of any of the broad categories. Japan is in the process of placing more weight on a general consumption tax, a broad-based national sales tax introduced in 1985. Tax reforms in the 1990s lowered the tax rates on corporate income, and increased the general consumption tax rate. Legislation enacted in 2012 will increase the consumption tax rate again.

The taxing authorities of Japan include the national and local governments. The local governments are those of the 47 prefectures (*to-dō-fu-ken*), 20 major cities, 767 lesser cities, 748 towns, and 184 villages (as of April 2012). In Japan the local taxing units have limited autonomy in setting tax rates and the like and the local tax rates vary less across jurisdictions in Japan than in countries like the US with federal rather than unitary governmental systems. For example, in Japan the standard municipal tax rate on property, including residential buildings, is set at 1.4 percent of assessed value.[6] In comparing the tax levels of different countries, some with federal systems (US, Canada, Germany) and others with unitary ones (Japan, Denmark, Finland, France, Greece, Italy, Luxembourg, Netherlands, Norway, Spain, Sweden, and the United Kingdom), it is sensible to look at national and local taxes combined rather than each separately. As seen in Table 11.3, the composition of taxes in Japan is similar to that of the other developed countries. Some details of the main Japanese taxes may be noted as follows.

[5] The report of the Shoup mission is available online: http://homepage1.nifty.com/kybs/shoup/shoup00.html.

[6] For details on the limited autonomy in tax-setting by local authorities in Japan see OECD, "Getting the Most Out of Public Sector Decentralisation," Table 4.6, pp. 122–3, in *OECD Economic Surveys: Japan 2005*, OECD Publishing, 2005.

Table 11.3. Taxes in Japan and selected other countries, 2010
Tax revenues by category, percentage of GDP, fy 2010

	Total	Social security wage taxes	Individuals	Corporate	Taxes on property	Estate, inheritance, and gift taxes	General taxes	Taxes on specific goods and services	Other
Japan	27.6	11.4	5.1	3.2	2.7	0.3	2.6	2.0	0.4
Canada	31.0	4.7	10.8	3.3	3.6	0.0	4.3	2.7	1.5
France	42.9	16.6	7.3	2.1	3.7	0.4	7.2	3.2	2.4
Germany	36.1	14.1	8.8	1.5	0.8	0.2	7.2	3.0	0.3
Italy	42.9	13.4	11.7	2.8	2.1	0.0	6.3	3.7	2.9
UK	34.9	6.6	10.0	3.1	4.2	0.2	6.5	3.7	0.5
US	24.8	6.4	8.1	2.7	3.2	0.1	2.0	1.7	0.6
OECD	33.8	9.1	8.4	2.9	1.8	0.1	6.9	3.5	1.1

Source: OECD, revenue statistics dataset.

Personal taxes and corporate income taxes

Personal income tax in Japan is progressive, meaning that the average tax rate is greater at higher incomes. Currently the national marginal tax rate on standard personal income ranges from 5 to 40 percent. The prefectural tax rate on personal income, the "inhabitants tax," is 4 per cent. (The municipal inhabitants tax levied by cities is actually a head tax, a mere 3,000 yen per person.) As in the US, the base for personal income tax consists of earned income net of various exclusions and deductions, the amounts of which depend upon marital status, number of dependents and so on. Income is taxed at a separate rate depending on the source. Income from dividends is 10 percent deductible up to a limit, which effectively means that dividend income is taxed at a ten percent lower rate than ordinary income. Interest income is taxed at the same rate as ordinary income. Retirement income is taxed at half the standard rate for ordinary income and only after applying very large deductions that result in most pension income not being taxed at all. Capital gains from real estate or securities sales are, after special deductions, taxed at a 30 percent rate if short-term and 15 percent rate if long-term (longer than five years). Gift taxes and inheritance taxes in Japan as elsewhere are easily avoided and afford a relatively modest stream of tax revenue.

Corporation income tax is progressive, but most corporate income subject to the tax falls into the highest bracket. In 1988 the highest national marginal tax rate on corporate income was reduced from 42 to 37.5 percent, then in 1996 reduced to 34.5, and in 1999 reduced again to 30 percent, its current level. The reductions in corporate tax rate followed complaints that the high rate was impeding the international competitiveness of Japanese firms. The standard prefectural tax rate on corporate income is five percent. That combined with other surtaxes and the like have pushed the effective marginal tax rate on the incomes of large Japanese corporations to roughly 40 percent.

For the prefectures, taxes on personal and corporate income are both called "inhabitants taxes." Corporations and other businesses are also obliged to pay further prefectural and municipal income taxes called the "enterprise tax." The local tax rates are lower than the corresponding national rates and the local governments have limited range within which to adjust these rates. The previous year's payments of inhabitant taxes are deducted from income in computing the base for the national tax. This means that the effective tax rate on personal and corporate income is not a straightforward addition of the national and local tax rates.

Consumption and excise taxes

In 1989 a 3 percent general consumption tax was introduced, and in 1997, a controversial step, raised to 5 percent. Among the last accomplishments of Prime Minister Noda, before his

Democratic Party of Japan was voted out of office in December 2012, was enactment of the law he had advocated to raise the consumption tax rate to 8 percent by April 2014 and 10 percent by October 2015. It is still below the value-added tax rates of most European countries. (A value-added tax is equivalent to a consumption tax but is collected from intermediate good suppliers as well as final good suppliers.)

Besides the consumption tax, the indirect taxes that provide the most fiscal revenue in Japan are those on liquor, tobacco, and gasoline.

Taxes on wages

Besides the taxes already described, there are also taxes on wages in Japan that are referred to as social security contributions or insurance premia. These are not voluntary, which means they are actually taxes. And together they comprise a sizeable and growing source of fiscal revenue in Japan, though not enough to cover the retirement pensions, health services and so on that these taxes are purported to fund. The combined total of these taxes on wages (including worker's accident compensation, employment insurance, health insurance, long-term care insurance and employee's pension insurance) currently stand at 28 to 30 percent of wages.[7]

The self-employed and their dependent spouses, from age 20 to 60, are required to pay a set monthly fee (¥14,980 per month as of 2013) and participate in a separate public pension program with lower benefits than are paid to retired employees. A large number of persons, around a fourth of the working age population, are defaulting on their obligations to pay this monthly head tax.[8] There are also taxes on the self-employed and their dependent spouses linked to (mandatory) participation in national health insurance. These taxes are based on an assessment of ability to pay. Default rates are unreported but presumed to be high.[9]

Our next task is to determine the total burden of the Japanese tax system, both in total amount and in relation to the fiscal revenues it generates.

Tax burden and incidence

The burden of a tax means the most that individuals would pay to avoid it altogether. The burden is usually a greater amount than the actual tax received. It can also be less than the receipts. The reason why tax burden and tax receipts diverge is that taxes induce acts of tax avoidance. The tax burden includes not only the tax itself but also the social costs or benefits of the avoidance behavior. In attempting to avoid taxes, individuals withdraw productive resources from taxed activities and redeploy them elsewhere. If, before the imposition of a tax, resources are allocated to their highest valued uses, then these redeployments are inherently wasteful. They entail diversion of resources away from more valued uses and towards less valued ones. But if the initial allocation was itself flawed, for example if it reflected the contrived scarcities of monopoly and cartels or if it reflected the distorting effects of still other government policies, then these tax-induced shifts in the deployment of productive resources can actually have a net social benefit.

The first step in measuring the burden of a tax is to determine who actually pays it. This is more difficult than one might suppose.

Tax incidence

The incidence of a tax, who pays and how much, is often obscure, not because the tax law is unclear but because a tax affects the supply and demand for goods and so alters the market prices and quantities on which the true economic incidence of the tax depends.

Incidence of an excise tax or wage tax

As shown in Figure 11.1, an excise tax or wage tax places a wedge between the price paid by the

[7] These figures are from: JETRO (Japan external trade organization), "Investing in Japan," in "section 4.9 Japan's social security system": http://www.jetro.go.jp/en/invest/setting_up/laws/section4/page9.html.

[8] The default rate is lower for those older than 36 years old and is higher for those with less financial means than others as documented by: Wataru Suzuki and Yanfei Zhou, "Increasing National Pension Premium Defaulters and Dropouts in Japan," *Gakushūin daigaku keizai ronshū*, vol. 47, no. 3, October 2010, pp.181–98.

[9] Default rates on national health insurance premiums are presumed to be high, as mentioned here: National Institute of Population and Social Security Research, *Social Security in Japan 2011*, p. 31. http://www.ipss.go.jp/s-info/e/Jasos2011/SS2011.pdf.

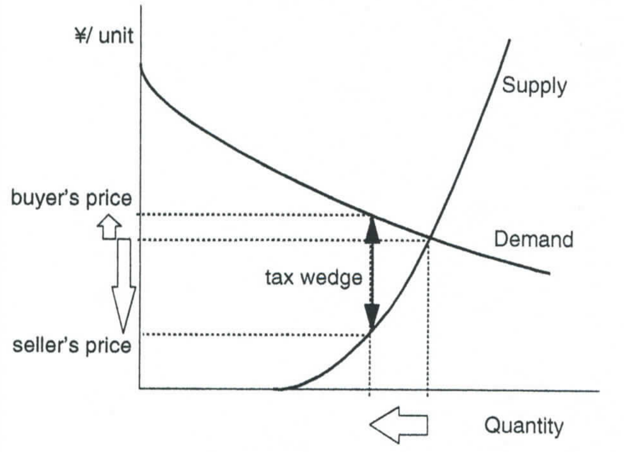

Figure 11.1. Tax wedge. A tax wedge raises the buyer's price and lowers the seller's price. The seller's price falls more the less elastic the supply and the more elastic the demand. Refer to footnote 10 for an algebraic derivation of this result.

demander and the price actually received by the supplier: *Tax per unit = Buyer's price – seller's price.* Demand depends on the buyer's price and supply depends on the seller's price and a tax can change both. The changes in buyer's and seller's price caused by the imposition of a tax depend on the elasticity of both supply and demand. If the supply is infinitely elastic at a set price—for instance if the good is supplied by a perfectly competitive industry with constant marginal and average cost—then the equilibrium supply price is unaffected by a tax and so the buyer's price must rise by the full amount of the tax. The demanders bear the full burden of the tax when the supply is infinitely elastic.

If the supply is perfectly inelastic, completely unresponsive to changes in the seller's price, then the supply is unaffected by a tax and so the seller's equilibrium price rises by the full amount of the tax. The suppliers bear the full burden of the tax when the supply is perfectly inelastic.

In intermediate cases, where the supply is neither infinitely elastic nor perfectly inelastic, the buyer's and seller's price are both changed by a tax; the smaller the elasticity of supply and the greater the elasticity of demand the more the seller's price is changed.[10]

In Japan as in the US, a portion of the social security wage tax is collected from employers and another from workers. But because the supply of labor is very inelastic, the after-tax wage falls by nearly the full amount of the tax. Workers bear nearly the full burden of the wage tax and employers almost none of it. What portion of the tax is collected from employers rather than workers has no effect on this.

Incidence of corporate income tax

Consider next the incidence of the corporate income tax. Here there are further subtleties. The first complication is the base of the tax, which is some concept of accounting profit, not to be confused with economic profit. *Accounting profit* is revenue minus actual expenses. *Economic profit* is revenue minus all costs including implicit costs. An implicit cost, or opportunity cost, is incurred by foregoing an alternative, but without bearing an expense. Competition among firms expands the supply of goods until expected economic profit becomes zero. But in such an equilibrium state with zero economic profit, accounting profit is positive and equal to the implicit cost of deploying the firm's assets in their current use rather than the next best alternative. In the competitive economy, accounting profit, which is the base for

[10] The arc elasticity of demand and of supply, both measured from the initial equilibrium price P_0 and quantity Q_0 without tax, are $\xi_D = -\frac{\Delta Q}{\Delta P_D}\frac{P_0}{Q_0}$ and $\xi_S = -\frac{\Delta Q}{\Delta P_S}\frac{P_0}{Q_0}$. It follows directly from these formulas that the ratio of absolute change in buyer's price relative to change in seller's price equals the ratio of the two elasticities: $\frac{|\Delta P_D|}{|\Delta P_S|} = \frac{\xi_S}{\xi_D}$.

the corporate income tax, equals the payment to the owners of the firm's productive assets (the shareholders) for the use of those assets. Accounting profit also includes any monopoly profit but that is small in aggregate, for Japan, the US and other developed economies.

The upshot of all this is that the corporate income tax is a tax on the implicit payments for the services of the firms' productive assets such as buildings, machines, and tools. If the supply of these assets were unchangeable, then the tax would be fully borne by their owners, the corporate shareholders. But the supply is not fixed. And as the shareholders withdraw their taxed assets from the corporate sector there are further effects. The marginal costs of production for corporations rise which leads them to supply less output, decreases their demands for labor, and raises the prices of their outputs. In this way some of the burden of the corporate income tax falls on workers and customers in the form of lower wages and higher prices. How much of the burden is shifted in this way has elicited debate.

In a much-cited 1962 paper, Harberger[11] argued that in the US, the corporate income tax caused a withdrawal of productive assets from the heavily taxed corporate manufacturing sector and redeployment to the non-corporate agricultural sector, where personal income could be disguised as a business expense and taxes avoided. Harberger concluded that the main effect of the US corporate income tax was a fall in the after-tax return to capital inputs, constriction of the corporate manufacturing sector and expansion of the non-corporate agricultural sector, with only small effects on prices and wages. But a key assumption of Harberger's analysis was that the economy-wide capital stock was fixed and unresponsive to prices. This is unlikely to be true of the long-run response to the corporate income tax. Professor Doi T(akero) of Keio University advances a model, calibrated to Japanese parameters, in which when Japan's corporate taxes are increased, the burden at first falls on corporate shareholders, but within a few years is shifted entirely to workers and consumers as the supply of capital shrinks.[12] Given the long history of corporate income tax in Japan, it seems likely that most of its burden now falls on workers and consumers.

Tax burden

In further considering the economic effects of Japan's taxes, let us presume that Japanese government resources are expended to provide particular goods and services: national defense, public education, health services, roads and bridges, utilities, retirement pensions and so on. In other words, stipulate that each Japanese citizen enjoys whatever benefits accrue to him from these goods and services independently of the size of his own tax burden. Our next question is, what is the least possible burden of the taxes needed to pay for these government expenditures, and how does that compare with the actual burden?

Setting aside the possibility that a tax system could offset distortions caused by other government policies or could correct market failures, the least possible tax burden would be that associated with a head tax. A head tax is a lump sum transfer that has no effect on prices. Because it has no effect on prices, the burden of a head tax, meaning the most that a person would pay to avoid it, is exactly equal to the amount of the tax. For taxes that do distort prices, the tax burden (under the stated assumptions) is greater than the amount of the tax. This is because people, after having paid a tax, are willing to pay still more to avoid the price changes induced by the tax. The difference between the burden of a tax and the tax receipts is called *excess burden*.

A general consumption tax that applied the same tax rate to all goods and services including leisure, would have no effect on relative prices. It would have the same behavioral effects as a uniform lump-sum head tax and have no excess burden. But the general consumption tax of Japan does not tax leisure and it is difficult to see how it could be made to do so. Because leisure is not taxed, its relative price is made lower by the taxes on other goods and people wastefully substitute

[11] Arnold C. Harberger. "The Incidence of the Corporation Income Tax," *The Journal of Political Economy*, Vol. 70, No. 3. (Jun., 1962), pp. 215–240.

[12] Doi T(akero), "Houjin zei no kichaku ni kan suru dougakuteki bunseki kanso na moderu ni yoru bunseki" (Incidence of the corporate income tax, dynamic analysis based on a simple model), *Mita Gakkai Zasshi* (Keio University), 2012, vol. 105, no. 1, pp. 15–29.

leisure for those other goods. They work less, enjoying more leisure but buying fewer consumption goods. This is wasteful because the relative prices that induce these choices differ from the marginal social costs of the corresponding objects of choice.

The income from work is also taxed directly by the social security wage tax and by the personal income tax. Taxes on income discourage saving, further contributing to excess burden. Income is only valuable because it can be used for consumption, either currently or in the future. A tax on consumption is in that sense a tax on income either in the current year or a previous one, and a tax on income is actually a tax on consumption. But because of discounting, with an income tax, the implied effective tax rate on future consumption is higher than that on current consumption. Compared with a direct tax on consumption, income taxes discourage saving. But based on empirical studies and economic logic this effect seems to be small.[13] Saving is largely motivated by attempts at balancing consumption over the life-cycle and is unresponsive to interest rates. There seems to be very little substitution of current consumption for deferred consumption in response to perceived higher real interest rates.

Corporate income taxes also contribute to excess burden. Some excess burden of the corporate income tax arises from wasteful substitution of labor for the taxed capital inputs of corporations. But more of the excess burden of the corporate income taxes results from tax shifting. To the extent the corporate taxes are shifted onto workers and consumers as lower wages and higher prices, they are effectively further taxes on the consumption of goods other than leisure, and contribute to excess burden in the same way as do other taxes on consumption. As a first approximation, one can regard this tax shifting as total; virtually all corporate taxes are shifted onto workers and consumers.

To conclude this discussion, all aspects of the Japanese tax system, including personal income taxes, corporate taxes, taxes on property, and taxes on consumption, fundamentally amount to a tax on the reward from work. The distorting effects of the Japanese tax system mostly reside in the reduced incentive to work entailed in taxes on goods other than leisure and on the income needed to purchase such goods. The size of these effects and their implied excess tax burden depend on the marginal tax rate on consumption embodied in the Japanese tax system, and depend also on the responsiveness of the Japanese to the reduced economic incentives to work.

Marginal tax rates

A marginal tax rate is a tax rate on the next increment of increase in the tax base. The marginal tax rate on consumption in Japan is greater than the average tax rate because the tax system is progressive, which just means that the average tax rate rises with income. This is most evident in the personal income tax schedule which, like that of the US, taxes income at differing marginal rates according to income brackets, applying higher marginal rates at higher brackets. Currently in Japan the highest national marginal tax rate on personal income is 40 percent (which applies to annual taxable incomes greater than 18 million yen). As incomes rise for whatever reason, taxpayers reach higher income brackets and must bear higher marginal tax rates. The simplest way of getting at a single number for the representative marginal tax rate on consumption in Japan is to observe the effect of year-to-year changes in nominal GDP on year-to-year changes in total tax receipts. From 1956 to 2010, the fairly persistent relation is that a one percent annual increase in Japan's nominal GDP is accompanied by a 1.18 percent increase in total tax receipts.[14] Japanese tax receipts respond elastically to changes in GDP, which reflects the tax system's general progressivity. The representative marginal tax rate on consumption in Japan is about 18 percent above the average overall tax rate that this marginal tax rate entails.

[13] Douglas B. Bernheim, "Taxation and Saving," in Alan J. Auerbach and Martin Feldstein (eds.), *Handbook of Public Economics, volume 3*, Elsevier, 2002, chapter 18, pp. 1173–1249.

[14] The OLS regression equation is: $d\ ln$ Taxes = –1.18 + 1.18 $d\ ln$ GDP, with standard error on the slope estimate equal to 0.11. The F-test statistic for the null hypothesis that the slope equals 1 is 2.55, significant at the 12 percent level of confidence.

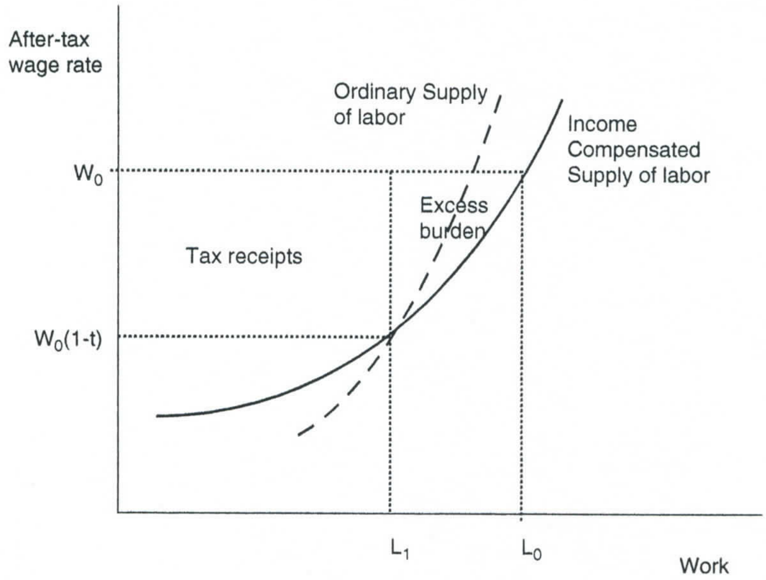

Figure 11.2. Excess burden. Excess burden is the most people would pay to replace an existing tax structure with non-distorting head taxes that collected the same tax receipts from each as before. The income-compensated supply of labor shows how labor supply would respond to a change in tax rate *t* if the workers were required to make lump-sum payments just sufficient to offset any changes in their self-perceived economic well-being. If the tax rate were reduced to zero, the amount of such compensating payments would equal the combined areas of the rectangle labeled "tax receipts" and the triangle labeled "excess burden."

Responsiveness of the supply of labor to changes in after-tax wages

The after-tax wage rate is the market price of an extra hour of leisure, an extra hour away from work. But a change in the after-tax wage rate also changes income even if the hours of work remain the same. Most people value leisure more as their incomes rise. In economics jargon, leisure is a normal good. So the higher income that accompanies a higher wage rate would lead a person to value leisure more, but the now higher "price" of leisure would incline him to choose less leisure and substitute for it more of the goods that can be purchased with the wages received from working. Over the years, as technology has advanced and machines, buildings, and tools have been amassed, wages have risen yet the hours of work per week, labor force participation rates, and typical ages at retirement have changed only slightly in Japan or elsewhere. This reflects the two opposing effects of the higher wage rate on labor supply, the income effect and the substitution effect. In thinking about the distorting effect of taxes, it is the substitution effect that matters.

Figure 11.2 shows the effect on labor supply as the (average) tax rate on wages is reduced (the figure presumes that the average tax rate is proportionate to the marginal tax rate). The supply curve in the diagram labeled "income-compensated" supply of labor shows only the substitution effect of the increase in after-tax wage rate. In moving upward along the curve, economic well-being is held constant by imposing an exactly offsetting system of head taxes.

The excess burden, the most that the people would pay to replace the existing tax system with a non-distorting system of head taxes that collected the same tax receipts from each as before, is shown by the area of the triangular region in the figure.[15] If the income-compensated supply of

[15] For a more complete diagrammatic exposition of excess tax burden refer to: John Creedy, "The Excess Burden of Taxation," *The Australian Economic Review*, vol. 37, no. 4, pp. 454–64.

labor has elasticity ξ measured from the no-tax point (L_0, w_0), then by linear approximation[16]

$$\begin{aligned} excess\ burden &= \tfrac{1}{2} t w_0 \Delta L \\ &= \tfrac{1}{2} t^2 \xi w_0 L_0. \end{aligned}$$

The excess burden varies in proportion to the elasticity of income-compensated supply of labor and in proportion to the square of the tax rate. This famous result was first noted by Jules Dupuit in 1844.[17] The distorting effects of taxes depend upon the responsiveness of people to changes in marginal incentives. The more responsive they are, the greater the distortion and the greater the excess burden of an otherwise neutral tax. Furthermore, doubling the tax rate quadruples the excess burden.

If elasticity of the income-compensated supply of labor ξ is measured from the point with taxes (L_1, $w_0(1\text{-}t)$), then we reach another useful linear approximation:[18]

$$\frac{excess\ burden}{tax\ receipts} = \frac{\tfrac{1}{2} t \xi}{(1-t)}.$$

Excess burden relative to tax receipts varies in proportion to the tax-exclusive tax rate $\frac{t}{(1-t)}$. In Japan in recent years general tax revenue is around 28.5 percent of GDP $\left(\frac{t}{(1-t)} = 0.4\right)$. Estimates of the elasticity of income-compensated supply of labor cluster around 0.3 (so $\xi = 0.3$). This suggests an excess burden equal to 6 percent of tax revenues, in other words around 1.7 percent of GDP.

The excess burden of the Japanese tax system is difficult to estimate precisely. My claim here that it might recently have equaled 6 percent of tax revenues is an educated guess at best. One likely source of error is the estimated elasticity of income-compensated supply of labor. There have been many estimates of the income-compensated labor supply elasticity of workers in the US and some European countries. In a recent survey of published estimates Michael Keane[19] shows that a simple average of estimates of elasticity of income-compensated male supply of labor across more than thirty papers published since 1969 is 0.31.

There have also been some estimates for Japanese workers. Economists S(hun-ichiro) Bessho and M(asayoshi) Hayashi[20] estimate income-compensated supply of labor by Japanese males between the ages of 25 and 55 in 2002 as 0.67 with standard error 0.03, about twice as great as the average for the estimates surveyed by Keane. In another paper Hayashi[21] reviews the many other published estimates of labor supply elasticities for Japanese workers and finds that these estimates generally do not correspond to the income-compensated elasticities with respect to after-tax wage that are needed for tax burden analysis.

A major difficulty in estimating the elasticity of supply of labor relevant for computing excess tax burden is that there are many ways labor supply can be reduced. For example, one may decide to work shorter hours, take more vacation days each year, work part-time rather than full-time, withdraw from the labor force altogether, or retire at an earlier age. All of these margins of choice matter, yet econometric estimates of labor supply typically focus on only one of them. Martin Feldstein[22] has shown that when all of the margins of adjustment in labor supply are operative, excess burden can be represented in a formula like the one shown above but with compensated elasticity of labor supply replaced by compensated elasticity of taxable income with respect to change in marginal tax rates. Estimates of this elasticity are imprecise but do not differ much from the estimates of compensated elasticity of supply of labor already

[16] The arc elasticity of income-compensated labor supply with respect to after-tax wage measured from the no tax point is $\xi = \frac{\Delta L}{(tw_0)} \frac{w_0}{L_0}$.

[17] Jules Dupuit (1844): "De la mesure de l'utilité des travaux publics," *Annales des ponts et chaussées*, Second series, 8. Translated by R. H. Barback as "On the Measurement of the Utility of Public Works," *International Economic Papers*, 1952, 2, 83–110 and reprinted in: Kenneth J. Arrow and Tibor Scitovsky, eds., *Readings in Welfare Economics* (Richard D. Irwin, Homewood, IL, 1969), 255–83.

[18] The arc elasticity of income-compensated labor supply with respect to after-tax wage measured from the point with taxes is: $\xi = \frac{\Delta L}{(tw_0)} \frac{w_0(1-t)}{L_1}$. Tax receipts equal $w_0 t L_1$.

[19] Michael P. Keane "Labor Supply and Taxes: A Survey," *Journal of Economic Literature*, 49:4, 2011, pp. 961–1075.

[20] S(hun-ichiro) Bessho and M(asayoshi) Hayashi, "Economic Studies of Taxation in Japan: The Case of Personal Income Taxes," *Journal of Asian Economics*, vol. 16(6), December 2005, pp. 956–72.

[21] Masayoshi Hayashi. "The Tax System and Labor Supply: Regarding Empirical Analysis in Japan," *The Japanese Economy*, vol. 36, no. 1, Spring 2009, pp. 106–36.

[22] Martin Feldstein, "Tax Avoidance and the Deadweight Loss of the Income Tax," *Review of Economics and Statistics*, vol. 81, no. 4, Nov. 1999, pp. 674–80.

mentioned. Economists Kitamura Y(ukinobu) and Miyazaki T(suyoshi),[23] using individual income tax data for Japan, estimate the compensated elasticity of taxable income with respect to changes in the marginal tax rate to be in the range 0.2 to 0.28.

It may seem that an excess burden of the Japanese tax system equal to 6 percent of tax revenues, 1.7 percent of GDP, is an unfortunate but tolerable social cost of funding government services. Indeed, the citizens of Japan apparently do hold such an opinion, for Japan's government is a representative democracy in which taxes are subject to approval by the voters. But it is worth pondering whether the added burden accompanying a further increase in taxes would also be tolerated. For instance, within the formula for excess burden we have used above and assuming an elasticity of income-compensated supply of labor (or income-compensated elasticity of tax revenue) equal to 0.3 (so $\xi = 0.3$), consider the effect of an increase in marginal and average tax rates. Suppose that the tax-exclusive tax rate $\frac{t}{(1-t)}$ is raised from 0.4 to 0.5 (i.e., the average tax rate is raised from 28.5 percent of GDP to 33.3 percent of GDP). Simple calculations show that the excess burden, from its initial level of 6 percent of tax revenue, would increase to 7.5 percent of tax revenue (would rise from 1.7 percent of GDP to 2.5 percent of GDP). This means that if GDP were unchanged, the tax increase equal to 4.8 percent of GDP would be accompanied by enlarged excess burden equal to 0.8 percent of GDP; roughly one sixth of the added tax revenue would be offset by increased economic waste. This leads us to the next topic, whether changes in Japan's tax system could lower its excess burden.

Tax reform and excess burden

Recent and proposed tax reforms in Japan can be regarded in part as attempts to lower the excess burden of the Japanese tax system. A further goal is to increase the perceived fairness of the system. A final goal, intertwined with the others, is to increase the total revenue collected.[24]

The first major change in the Japanese tax system in the postwar period was the introduction of a 3 percent national consumption tax, enacted in 1988 and put into effect the following year. The consumption tax was raised to 5 percent in 1997, and by legislation enacted in 2012 is slated to rise to 8 percent by April 2014 and 10 percent by October 2015. The second major change, after the introduction of consumption tax, was a reduction in marginal tax rates on personal and corporate income and increase in special deduction for spouses in calculating taxable personal income, put into effect in 1999.

To reduce the excess burden of a tax system without reducing tax revenue requires lowering the marginal tax rates borne by a preponderance of citizens. One way to accomplish this is to make the tax system less progressive, which may conflict with notions of fairness. Another way to lower excess burden is to broaden the tax base. For example, closing loopholes that only some citizens exploit would make it possible to lower the marginal and average tax rates for everyone else, and still collect the same revenue as before the loopholes were closed. The reduction in excess burden on those facing lower marginal tax rates could more than offset the increase in excess burden on those whose loopholes were closed.

In Japan, increasing the consumption tax rate, if coupled with a decrease in marginal tax rates on income, can reduce excess burden. The consumption tax is less progressive than the income tax. Also, the consumption tax in Japan is more difficult to evade than the income tax. Those who are employees of corporations or of government in Japan are subject to income-tax withholding, and would have difficulty evading income taxes. But underreporting of personal income by the self-employed is thought to be widespread. And those who are retired and living on pensions are largely

[23] Kitamura Yukinobu and Miyazaki Tsuyoshi, "Nihon ni okeru genkai zeiritsu no kazei shotoku danryokusei to saiteki shotoku zeiritsu: zenkoku shouhi jittai chousa no kohyou deeta ni yoru bunseki" (Taxable income elasticity of marginal tax rates in Japan and the optimal income tax rate: Analysis using individual data from national consumption survey), Global COE Hi-Stat Discussion Paper Series No. 150, Hitotsubashi University Institute of Economic Research, 2010.

[24] Becker and Mulligan advance the thesis that tax reforms which reduce excess burden weaken the political pressures opposing tax increases. In other words, improving the efficiency of a tax system promotes higher taxes. Gary S. Becker and Casey B. Mulligan, "Deadweight Costs and the Size of Government," *Journal of Law and Economics*, vol. 46, no. 2, October 2003, pp. 293–340.

exempt from income taxes in Japan. The consumption tax burden falls on these otherwise un- or partially taxed citizens enabling lower tax rates for everyone else.

Government borrowing

In any given year tax receipts may be less than government spending, a fiscal deficit. In such event, the government borrows, usually by selling government bonds of one sort or another, against promises of future payment. In Japan today the outstanding amount of Japanese government debt has risen to a level above that of the GDP and continues to grow. Is this a problem?

A useful way of thinking about government debt is that it arises from the shifting of taxes through time. When is it socially beneficial for the government to borrow? This is really a question about the timing of taxes. To focus narrowly on that, let us take the stream of government spending net of debt servicing as a given. What then is the optimal timing of taxes? Set aside for the moment differences among taxpayers and define optimal as most preferred by a representative individual citizen.

It turns out that the optimal tax stream would collect the same fraction of GDP in each year, minimizing the present value of the stream of taxes needed both to cover government debt servicing and the exogenously given stream of other government spending. This argument for tax smoothing was introduced in a 1979 paper by Robert Barro.[25]

Tax smoothing

Stipulate that national taxes in year j depend on nominal GDP according to a set schedule $T_j(y_j) = a_j y_j^{\theta}$, where y is nominal GDP and a and θ are parameters. As discussed above, for Japan θ = 1.18, which indicates the Japanese tax system is progressive. Let us now take the parameter θ as given and inquire how the other parameter a_j should be adjusted each year. It is convenient to frame the question as pertaining to the choice of an average tax rate in each year: $\tau_j = a_j y^{\theta-1}$. Here, the marginal tax rate $\theta\tau_j$ is proportionate to the average tax rate. Based on the earlier discussion, the excess burden of taxes in year j varies with the square of the tax rate τ, and with the elasticity ξ of the income-compensated supply of labor: $\frac{1}{2}\xi\tau_j^2 y_j$.

Denote as G the present value of the infinite future stream of government spending other than for servicing government debt yet to be incurred. Similarly, denote as T the present value of the stream of taxes including seigniorage, and as B the present value of the excess tax burden. Suppose that, currently, the outstanding government debt is D_0 and consider what average tax rate in each subsequent year would minimize the present value of excess tax burden, taking as given that the present value of taxes must be large enough to pay for the given stream of government spending and also service the government debt. The problem is to choose $(\tau_1,\ldots,\tau_j,\ldots)$ to minimize B, subject to the constraint that $T \geq D_0 + G$. The optimal solution[26] is to choose the same average tax rate in each year $\tau_j = \dfrac{D_0 + G}{Y}$.

The reason this "tax smoothing" policy is optimal is that the excess burden in any one year rises with the square of the tax rate. The total excess burden is minimized by spreading the tax burden as widely as possible over the years, not concentrating it in selected years.

Because the tax schedule is progressive, to maintain a constant average tax rate means that the tax schedule is adjusted upward in recessions and downward during booms. This is counter to the stabilization of business cycles in the Keynesian view of fiscal policy. Tax smoothing is best viewed

[25] Robert J. Barro, "On the Determination of the Public Debt," *Journal of Political Economy*, 87(5), 1979, pp. 940–71.

[26] Form the Lagrangian objective function as follows:

$$\min_{\tau_1,\ldots,\tau_\infty} L = B - \lambda(T - D_0 - G),$$

where r_j is the rate of interest in year j and

$$G = \sum_{j=1}^{\infty} \frac{G_j}{(1+r_j)^j},\; T = \sum_{j=1}^{\infty} \frac{\tau_j y_j}{(1+r_j)^j},$$

$$B = \sum_{t=1}^{\infty} \frac{\frac{1}{2}\xi\tau_j^2 y_j}{(1+r_j)^j} \text{ and } Y = \sum_{j=1}^{\infty} \frac{Y_j}{(1+r_j)^j}.$$

The solution is:

$$\frac{\partial L}{\partial \tau_j} = \frac{\xi\tau_t y_j}{(1+r_j)^j} - \lambda\frac{y_j}{(1+r_j)^j} = 0, j = 1,\ldots\infty$$

$$\tau_j = \frac{\lambda}{\xi} = \frac{D_0 + G}{Y}$$

as a fundamental principle of tax policy, separate from business cycle considerations. The 1960 report of the Japan Tax Commission actually did propose that the burgeoning tax revenues then resulting from Japan's rapid economic growth should be followed by reductions in the tax schedule so that national and local taxes would remain near 20 percent of GDP.[27]

A crucial point emerges from the tax-smoothing logic. To borrow in years when government spending is great and pay down the debt in years when it is not lowers the excess burden of taxes and is worth the added borrowing cost it requires. But outstanding Japanese government debt has now reached nearly unprecedented levels. A natural question arises: Are Japanese taxes high enough in relation to the expected future trajectory of Japanese government spending?

Sustainability of government debt

In recent years the outstanding government debt in Japan has grown large in relation to GDP. There are two reasons. The first is that Japan's recent recessions, and deflation since the 1990s, have eroded incomes, pushing households and businesses into lower marginal tax brackets and reducing tax revenues. The second reason is the increasing proportion of the Japanese population who are over 65 and retired, which means more government spending for social security pensions and health care and a smaller labor force paying wage taxes. In the tax smoothing logic, transitory episodes of increased government spending are efficiently financed not by increasing the tax schedule but by issuing government debt. The reduced tax revenue during a recession, to the extent it reflects progressivity of the tax schedule, may be regarded as an automatic stabilizer, a Keynesian stimulus automatically triggered by recession. For these reasons, the recent expansion of Japanese government debt may be tolerated, even welcomed. But attention has been drawn nevertheless to the large scale of Japanese government debt relative to GDP, both in comparison with other developed countries and with Japan's own history.

Figure 11.3 depicts the level of outstanding Japanese general government debt relative to GDP for fiscal years 1980 to 2017, as reported by the IMF. General government includes both national and local governments. The observations for 2011–2017, shown by dashed lines, are forecasts. In the figure, net debt excludes Japanese government securities held by the Bank of Japan, Japan Post, and other Japanese government entities. Alarmists have been quick to note that gross government debt (i.e., including debt held within the government itself) is more than twice as great as GDP, but net debt is what matters for default risk. The net debt too has grown in the last decade, reaching 113 percent of GDP in fiscal year 2010, high compared to most other developed nations. This has prompted a series of academic papers exploring whether such a large amount of outstanding government debt in relation to GDP is "unsustainable"—meaning that if there are no major adjustments in the tax schedule or in government spending programs, the debt will continue to grow until the government must either default or debase the currency. In a 2004 paper Christian Broda and David Weinstein[28] argue that the debt is sustainable; a minor upward adjustment in Japanese taxes will suffice to assure Japanese government solvency. More recent studies by Takatoshi Ito[29] and by Takero Doi, Takeo Hoshi and Tatsuyoshi Okikmoto[30] argue the opposite, that the Japanese government debt is unsustainable; a major adjustment in the tax schedule or in government spending is required to avert an impending Japanese government debt crisis.

The question these studies are asking is whether, under the current fiscal regime, the present value of all Japanese government spending extending into the indefinite future is greater than the

[27] Tax Bureau, Ministry of Finance, *Comprehensive Handbook of Taxes 2010*, pp. 9–10. http://www.mof.go.jp/english/tax_policy/publication/taxes2010e/index.htm.

[28] Christian Broda and David E. Weinstein, "Happy News from the Dismal Science: Reassessing the Japanese Fiscal Policy and Sustainability," in Takatoshi Ito, Hugh Patrick, and David E. Weinstein (eds.), *Reviving Japan's Economy*, Cambridge, Mass.: MIT Press, 2004, pp. 39–78.

[29] Takatoshi Ito, "Sustanability of Japanese Soverign Debt," in T. Ito and F. Parulian (eds.), *Assessment on the Impact of Stimulus, Fiscal Transparency and Fiscal Risk*. ERIA Research Project Report 2010-01, 2011, pp. 29–76. ERIA [online]. Available at: www.eria.org/publications/research_project_reports/images/pdf/y2010/no1/ch2Sustainabil_of_Japanese_Sovereign_Debt_Ito.pdf.

[30] Takero Doi, Takeo Hoshi, and Tatsuyoshi Okimoto, "Japanese Government Debt and Sustainability of Fiscal Policy," *Journal of the Japanese and International Economies*, vol. 25, 2011, pp. 414–33.

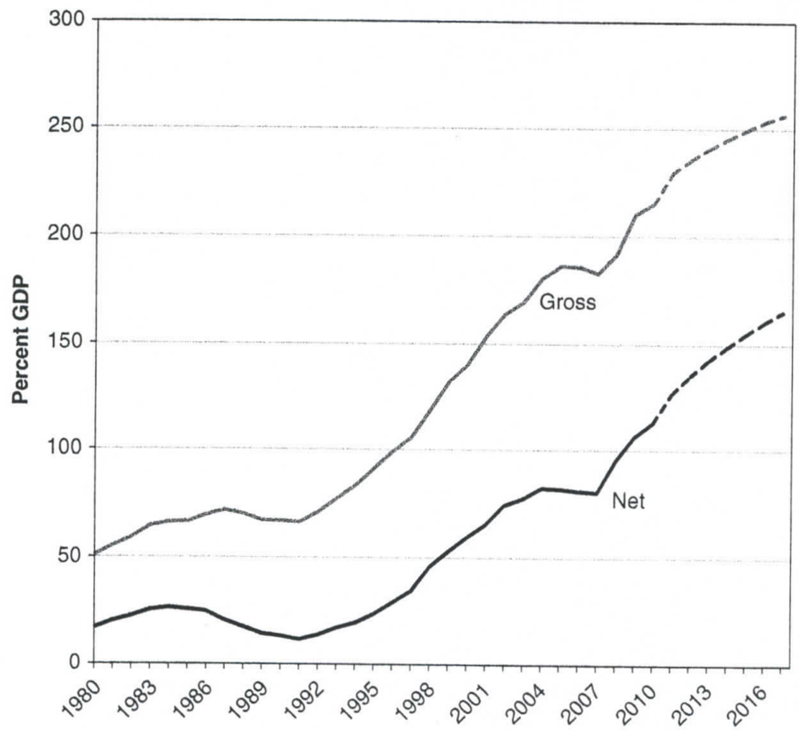

Figure 11.3. General government debt of Japan, percent of GDP, 1980–2017
Source: International Monetary Fund, *World economic outlook dataset.*

present value of the stream of taxes. The conclusion that the Japanese government debt is unsustainable amounts to a belief that with no fiscal adjustments the government spending to GDP ratio (averaging from 40 to 50 percent) is likely to remain significantly greater than the tax revenue to GDP ratio (which is around 30 percent). The yields on Japanese government bonds remain at historic lows. As of March 2013 the nominal yield on benchmark 10-year Japanese government bonds stands at 0.67. Bond market investors apparently expect a fiscal adjustment. A significant increase in Japanese taxes in the near future seems the most likely such adjustment.

Conclusion

An efficient tax system minimizes the economic burden of paying for government services, subject to political and technical constraints. In the pre-1945 era Japan's Imperial government depended for funding on customs duties, profits from government monopolies, taxes on specific goods, military conscription, and debasement of the currency. These distorting and inefficient ways of taxing Japanese citizens were an inevitable bow to constraints not unlike those facing developing countries of today. Broader and more efficient taxes were inhibited by the informal organization of much economic activity, outside the easy purview of government tax collectors. Furthermore, the Imperial government itself was not in the end democratic. Its military overlords were not eager to widen political participation in ways that a broader and more efficient set of taxes would have required.

Today things are different. The Japanese tax system is now similar to those of other developed countries like the US, UK or Germany. The tax system is progressive; those with more income face higher tax rates, which is apparently what the Japanese citizens desire, as expressed through the ballot box. The Japanese government levies a broad set of taxes on the wages and incomes of individuals, on the incomes of corporations, on fixed assets, and on consumption. These taxes reduce the private reward from work, leading workers to substitute leisure for other goods, even though the leisure is less valued by them than the goods their labor could have instead produced. Largely for this reason, the burden of taxes in Japan is six percent larger than tax revenues, according to the rough estimate found in the current chapter. Japan's increasing reliance on the consumption tax, a broad-based tax that is difficult to evade, will make the tax system more efficient, rendering tax increases more politically palatable.

In recent years Japanese government spending has grown faster than tax revenues. The aging of the population has enlarged spending on social security pensions and government provided health services, while price deflation and recessions have reduced tax revenues. To minimize the burden of taxes requires tax smoothing, which means keeping the tax schedule stable, even as government spending changes. But Japan's government debt is now larger than its GDP and continues to grow. To balance tax revenues with government spending an adjustment seems necessary. Taxes are likely to go up in Japan in the near future.

FURTHER READING

■ Bernard Slanié, *The Economics of Taxation*, 2nd edn, MIT Press, 2011, pp. 25–30. Very condensed algebraic treatment of its subject. An excellent introduction to the vast but esoteric literature on tax distortions, tax incidence, and the design of an optimal tax system.

■ Tax Bureau, Ministry of Finance, *Comprehensive Handbook of Japanese Taxes 2010*. A thorough but turgid description of the various taxes currently levied in Japan.

■ Hiromitsu Ishi, *The Japanese Tax System*, 3rd edn, Oxford: Clarendon Press, 2001. Description and critique of Japanese taxes and how they have changed over the years.