

DEFLATION AND JAPAN REVISITED

RICHARD C.B. JOHNSON

Conventional wisdom tells us that deflation counts among the worst things that can happen to an economy. Lately, the word deflation has become almost synonymous with Japan and its economic problems. But are falling prices *really* that bad? According to the Austrian School of economics, this is not necessarily the case. In fact, falling prices are in most cases regarded as benign.

With this view in mind, the development of the Japanese economy of 1990-2001 is revisited. Among other things, the deflation at times was a consequence of rising aggregate supply while at other times of a combination of cash-building deflation and bank-credit deflation, all of which are regarded to be basically benign free-market responses to changing circumstances (whether good or bad).

Although based on the same set of data, these findings diverge sharply from the official Japanese view of the economy at the time. This is ascertained by studying the official records from when the fear of deflation first emerged.

This paper proceeds by explaining deflation and aggregate price determination in more detail. Then, some facts about the development of Japan, 1990-2001, are provided, together with an extensive interpretation. This is followed by a closer examination of the official Japanese interpretation, contrasting it with my own views. Finally, some concluding remarks are offered.

SOME THEORETICAL REMARKS

Adherents of the Austrian School of economics usually define deflation and inflation in terms of changes in the overall money supply, while the mainstream definition refers to changes in average prices. To avoid confusion, the

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mainstream definition is used, thus defining deflation as falling average prices.

An attempt to present an Austrian taxonomy of deflation was recently made by Salerno (2003). He classifies the causes of falling prices as follows: (i) growth deflation; (ii) cash-building deflation; (iii) bank credit deflation; and (iv) confiscatory deflation. The first two operate on the demand side of the “money relation,” the last two on the supply side. Salerno concludes that the first three causes, in a free market of voluntary cooperation, are benign responses to changing circumstances, while the last kind—of coercive intervention in the free market—is basically bad. Note that this allows for the possibility that the changing circumstances themselves could be either good or bad.¹

Changes in the money supply tend to affect prices by way of changes in the overall volume of spending. A simple formulation of this view appears as follows: More money equals more spending equals higher prices, or conversely, less money equals less spending equals lower prices. This can be represented by the formula:

$$P = D / S \tag{1}$$

where P is the average price level, D the aggregate demand *in nominal terms* and S the supply of goods and services expressed *in physical terms*, all during a given period.² Formula (1) tells us that the prices would fall in connection with (a) a rise in physical production and supply of goods and services or (b) a fall in aggregate demand. The case of (a) would correspond to growth deflation, while (b) would be caused by either cash-building, bank credit contraction, or government-confiscatory deflation.³

Thus, according to the view adopted in this paper, from an economy-wide perspective, we need not fear deflation unless it is forcibly imposed on the

¹See Salerno (2003) for more on this. See also Rothbard (1962, pp. 672-75) and the *Quarterly Journal of Austrian Economics*' (Winter 2003) special edition on deflation. See also Reisman (2003) for a slightly differing view, a view that will find some support in the evidence presented below.

²This formula was used already by the classical economists. See for example J.S. Mill (1848, Book III, Chap. II, §3).

³Although the main determinant of aggregate demand is the money supply, it is fully conceivable that in the short run, these magnitudes might move in opposite directions. It is of course also perfectly conceivable that changes in aggregate demand and aggregate supply could have a mutually offsetting influence on prices, as well as one of the two dominate in any particular instance. For example, it is conceivable that if for some reason the aggregate demand were to decrease by 6, 8 or 10 percent, and at the same time the aggregate supply were to decrease by 2 percent, the price level fall by 4.1, 6.1, and 8.2 percent. We will see examples of both of these kinds of change below.

free market by government intervention. With this in mind, we revisit the Japanese experience.

ANALYZING THE JAPANESE DEFLATION

To see how the Japanese economy developed during the 1990–2001 period, we start by focusing on aggregate demand and prices. When it comes to aggregate demand, this paper will rely on the Gross Domestic Revenue (GDR) measure of nominal spending, as outlined by Reisman (1996). This measure differs from the widely used Gross Domestic Product (GDP) measure in that it includes not only (i) gross investment expenditure on fixed assets, but also (ii) gross investment on inventories and work in progress, as well as (iii) the current business expenditure that is charged off in the year it is incurred (as opposed to being amortized over a period of years).⁴ These three items are together referred to as *productive expenditure*. By taking the full productive expenditure into account (and not only one component of it, as in GDP), some interesting facts are revealed fully in line with Austrian thought.⁵

Table 1 shows the changes in GDR as well as the Money Supply (MS—measured as M1), the Consumer Price Index (CPI) and the Producer Price Index (PPI).⁶

Table 1
Changes in GDR, MS, CPI, and PPI, 1991–2001, percent

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
GDR	5.7%	1.4%	-1.0%	0.8%	2.1%	2.8%	2.8%	-2.2%	-1.9%	1.6%	-0.9%
MS (M1)	8.8%	1.9%	3.4%	4.9%	12.8%	10.0%	8.9%	6.1%	11.8%	4.1%	13.6%
CPI*	3.3%	1.7%	1.3%	0.6%	-0.1%	0.1%	1.8%	0.6%	-0.3%	-0.7%	-0.7%
PPI**	-2.1%	-1.4%	-3.3%	-1.0%	-0.3%	-0.1%	1.6%	-4.4%	-1.5%	1.1%	-0.9%

Sources: Economic and Social Research Institute and my own calculations (GDR), Statistics Bureau, and Statistics Center, Ministry of Public Management, Home Affairs, Posts and Telecommunications, Government of Japan (CPI) and Bank of Japan (MS and PPI).

Notes: *Yearly average, y/y figures **End of year y/y figures.

⁴This means that [gross investment in fixed assets = net investment + depreciation of fixed assets] and that [gross investment in inventories and work in progress = net investment + cost of goods sold].

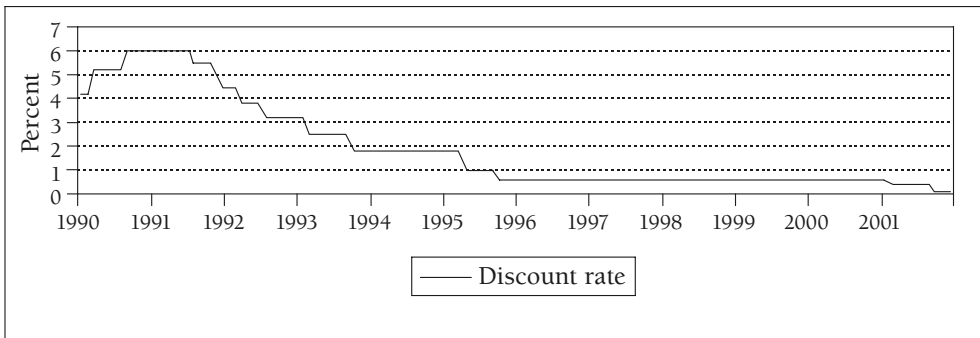
⁵See Appendix for more about GDR and its relation to GDP. The GDR measure is approximately 2.5 times larger than GDP. During the period at hand, GDR was more volatile than GDP. The changes were of the same sign and of a similar order, except in 1993 when GDP increased by 0.7 percent while GDR fell by 1.0 percent.

⁶PPI as represented by the Overall Wholesale Price Index (OWPI). The OWPI is the weighted average of the Domestic Wholesale Price Index (DWPI), the Export Price Index (EPI), and the Import Price Index (IPI). The OWPI focuses on the prices of goods traded among corporations.

From the GDR data we can single out 1993, 1998, 1999, and 2001 as years when the aggregate demand fell, i.e., these were years of deflationary pressure. The rest of the years should then be years of inflationary pressure.

From the money supply data, it appears that the Bank of Japan (BoJ) did its very best to make sure that the money supply inflated during the period under consideration. Evidence of this is the aggressively loose monetary policy conducted, including consecutive rate cuts down to record low levels, as shown in Figure 1. This means that the fourth cause of deflation discussed above could be excluded, namely the confiscatory deflation where there is a contraction in the money supply brought about by government intervention. Thus, only the other three benign causes of deflation have to be considered.

Figure 1
The Bank of Japan discount rate, 1990-2001



Source: Bank of Japan

When considering prices, we see that consumer prices fell in 1995, 1999, 2000, and 2001, and rose in all the other years. Producer prices fell every year during the period except in 1997 and 2000 when they rose. As productive expenditure accounts for roughly three-fourths of the overall GDR expenditure (see Appendix), we can make the rough conclusion that overall prices seem to have fallen in 1991, 1992, 1993, 1994, 1995, 1996, 1998, 1999, and 2001, i.e., all years but 1997 and 2000. On top of that, prices of real estate have fallen every year during the period and the average price of a share at the Nikkei stock market has fallen by over 70 percent. (Interestingly, the trading volume has risen by over 80 percent.)

Thus, the signs shown in Table 2 are implied. From this the following preliminary conclusions are made. (1) Apparently, deflation was caused exclusively by rising aggregate supply in 1991, 1992, 1994, 1995, 1996; i.e., there was growth deflation, since aggregate demand was rising in these years. (2) Deflation in 1993, 1998, 1999, 2001 may have been caused by any of the three causes under consideration, i.e., growth, cash-building or bank credit deflation.

Table 2
Sign of Changes in Money Supply, Prices and
Aggregate Demand, 1991-2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Money Supply	+	+	+	+	+	+	+	+	+	+	+
Aggregate Demand	+	+	-	+	+	+	+	-	-	+	-
Prices	-	-	-	-	-	-	+	-	-	+	-

With respect to the second of these conclusions, it should be noted that confiscatory deflation as a cause of the deflation has been ruled out. This suggests that the combinations of deflation and falling aggregate demand displayed in Table 2 were caused either by cash-building deflation or by bank credit deflation—likely both. It is clear that one major cause of the Japanese problems has been the banks, so it seems likely that there has been at least some bank credit deflation. At the same time, the possibility of rising supply as being a partial cause of the deflation cannot be excluded.

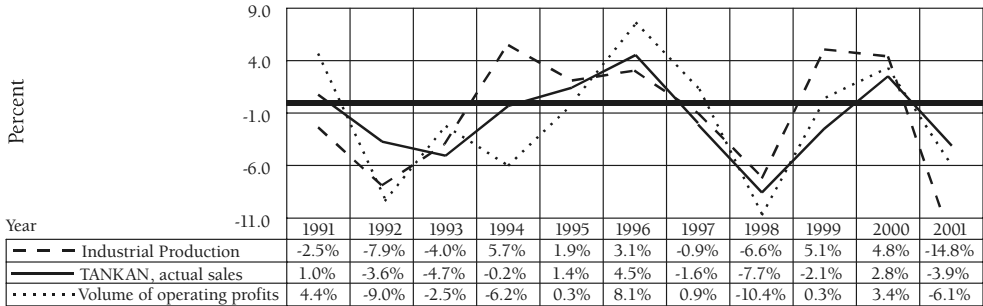
Some support is found for the preliminary conclusion that rising aggregate supply has caused deflation. For example, the Industrial Production Index (IPI) rose in 1994, 1995, 1996, 1999, and 2000, as shown in Figure 2 (setting the other figures to the side for a moment). This suggests that, at least in 1999, rising supply may have been among the causes of the deflation. On the other hand, the fact that IPI didn't rise in 1991 and 1992 contradicts the first preliminary conclusion. Regardless, we obtain these conclusions:

1. Deflation in 1994, 1995, 1996, and 2000 was exclusively caused by rising supply, i.e., there was growth deflation.⁷ This could also have been the case in 1991 and 1992, but the evidence is somewhat contradictory.
2. Deflation in 1993, 1998, and 2001 was exclusively caused by falling aggregate demand, suggesting cash-building or bank-credit deflation.
3. Deflation in 1999 was caused by a combination of growth, cash-building and bank-credit deflation.

When considering the relationship of deflation to falling aggregate demand, we find a debate over whether the falling demand could cause some

⁷Perhaps the most notable case of falling prices due to increasing production and supply would today be Mainland China. See for example Federal Reserve (2002b) and Lo (2003).

Figure 2
Changes in Industrial Production, Tankan Sales and Volume of Operating Profits, Japan 1991-2001, percent



Sources: Economic and Social Research Institute; Bank of Japan; Ministry of Economy, Trade and Industry and own calculations.

serious economy-wide problems. First, consider the theoretical argument. On the one hand, Reisman (2003) argues that contraction of the money supply and aggregate spending could cause, in all but the growth deflation case, sales revenue and profits to fall and this in turn creating debt repayment problems. (However, the solution to such problems would still be falling prices.) On the other hand, Bagus (2003, p. 32) argues that there is no inherent reason why costs couldn't fall faster than prices, thus suggesting that Reisman's argument is invalid. However, Bagus bases his point on the idea that costs are equal to wage payments, which is far from true. Basic knowledge about income statements and balance sheets tells us that even in the case in which a business were to cut its wages down to zero, and even if all kinds of spending were to come to a halt, there would still be costs for the business in the form of depreciation against fixed assets and cost of goods sold (if inventories are cleared). Thus, there is an inherent lag between, on the one hand, prices and sales revenue, and, on the other hand, costs. It thus seems that there is some theoretical justification for Reisman's view. What about the empirical evidence?

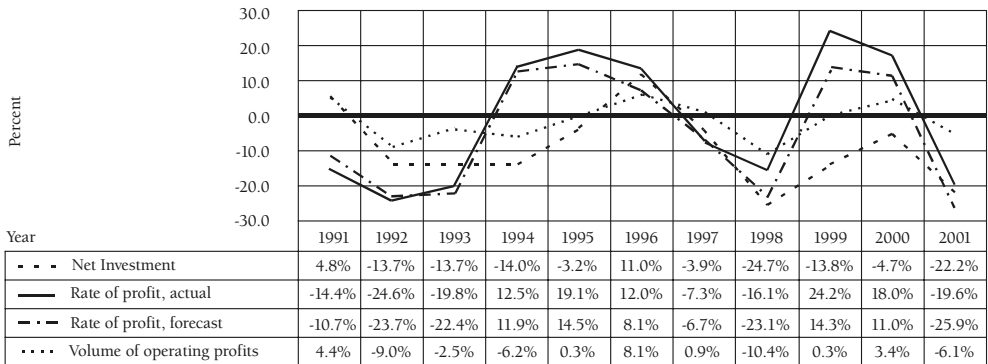
From Figure 2 we see that sales and profits actually fell in the deflationary years of 1993, 1998, and 2001, when falling aggregate demand was the main cause of the deflation. Since 1994 was a year of growth deflation, the falling prices of 1993 actually appear to have been sufficient to overcome the problems. The same might hold for 1999 when IPI rose 5.1 percent, but the evidence is not conclusive. The year 2002 falls outside of the scope of this study. Thus, while the data provide some empirical support for Reisman's view on the problems related to falling aggregate demand, it is interesting to note that nothing in the data contradicts the idea that falling prices mitigate the problems with falling aggregate demand, sales, profitability, and debt repayment.

Some further comments

A few interesting remarks before turning to the official Japanese interpretation. First, data that reveals something important: that Japan has not been in a Keynesian/Hicksian "liquidity trap." The MEC and IS curve in the IS-LM

analysis—i.e., the foundations of the idea of the liquidity trap—says that the relationship between the rate of profit and net investment is negative. That is, when the rate of profit falls, net investment would rise, and vice versa. But, by plotting the net investment against the rate of profit—both in terms of the actual and the forecasted as well as in the form of the change in the volume of profits—reveals that this has been far from clear. In fact, it is tempting rather to draw the opposite conclusion, as the variables have moved closely together in Japan during the 1991–2001 period. Hence, the idea of the liquidity trap in Japan seems to be refuted.⁸

Figure 3
Changes in Net Investment, Changes in the Volume of Operating Profits and the Rate of Profit, Both Actual and Forecasted, Japan 1991–2000, percent

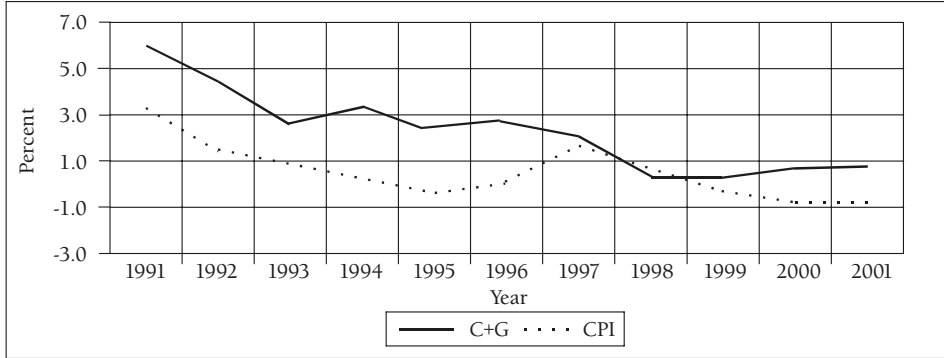


Sources: Economic and Social Research Institute (net investment and volume of operating profits) and the Tankan—Short-term Economic Survey of Enterprises in Japan of the Bank of Japan (rate of profit).

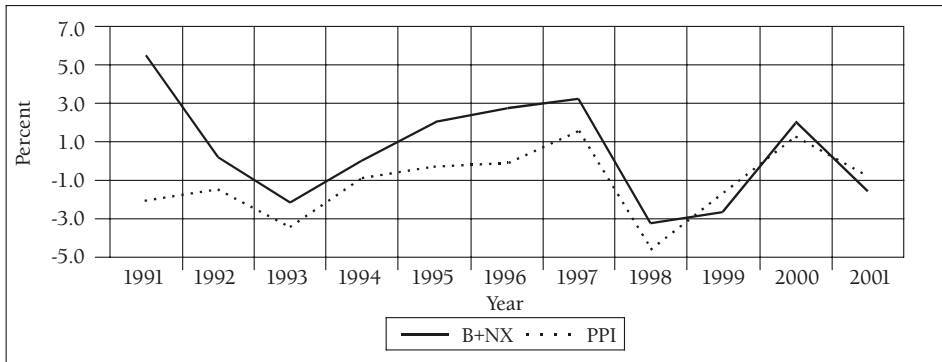
Second, credibility should be given to the GDR measure, the use of formula (1), and hence my interpretation thus far. The changes in CPI and PPI can be interpreted by studying the parts of GDR expenditure made for the purpose of consumption and production, respectively. This follows since formula (1) could be applied to any part of the bulk of expenditure as well. Thus, we could compare the changes in the two different kinds of expenditure to the respective price changes (CPI and PPI). The upper part of Figure 4 shows the changes in consumption expenditure (C+G) and in CPI while the lower shows the changes in productive expenditure plus net exports (B+NX) and PPI. Suddenly, the changes in CPI and PPI appear to make some sense. They follow closely the changes in the respective kind of expenditure.

⁸This helps explain why Krugman (1998b), for example, has such a problem in applying the liquidity trap to Japan. For example, he changes investment on the horizontal axis to consumption, i.e., the exact opposite. For more on the flawed idea underlying the liquidity trap theory, see Johnsson (2003).

Figure 4
Changes in Private and Public Consumption Expenditure (C+G) vs.
Consumer Price Index (CPI)



Changes in Productive Expenditure and Net Exports Expenditure (B+NX) vs.
Producer Price Index (PPI), Japan 1991-2000, percent



Sources: Economic and Social Research Institute, Bank of Japan, and own calculations.

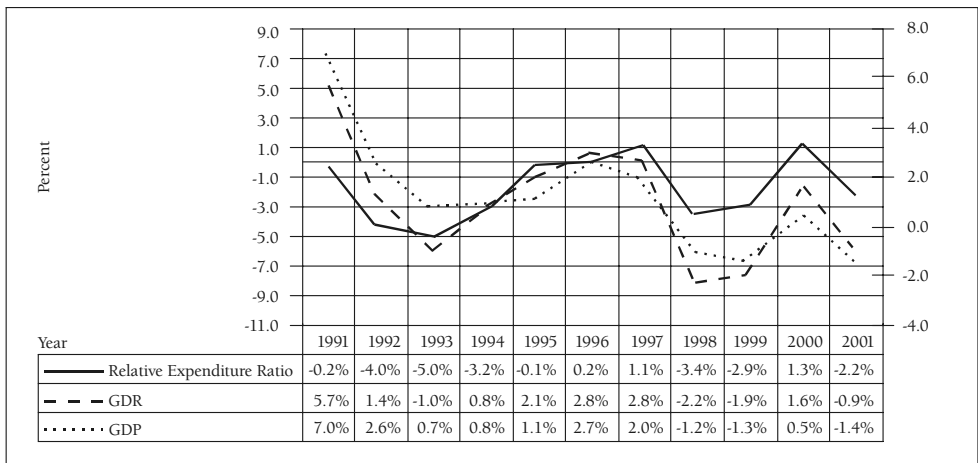
Third, according to the Austrian School of economics, to get a full understanding of the dynamics of an economy one must study not only expenditures on and prices of consumers' goods, but also the expenditures on and prices of capital goods.⁹ If for some reason people voluntarily choose to invest more funds in production, rather than consuming them, we might expect capital accumulation and that more will be produced in the future. In the same way as expenditure made for the purpose of consumption tends to make an individual poorer, *ceteris paribus*, and expenditure for productive purposes tends to make an individual richer, *ceteris paribus*, this also holds at an economy-wide level. While more overall expenditure on consumers' goods—at the expense of investment—certainly enriches the sellers of these goods, if it is continued, the capacity to produce capital goods is diminished.

⁹This is often referred to as the structure of production. See, for example von Strigl (1934, p. 27), Rothbard (1962, Chap. 5), or Garrison (2001, Chap. 3). See also Reisman (1996, pp. 820-24 and 852-24).

And since the consumers' goods are produced with the aid of such capital goods, the production of consumers' goods will also be diminished. Hence, consumption will after some time have to fall. In line with this kind of reasoning, a clear distinction may be made between consumers' goods and capital goods—between consumption and production or investment.¹⁰

One way to illustrate this is to relate the productive expenditure to the expenditure made on consumption. Defining the Relative Expenditure Ratio (RER) as the ratio between the [B+NX] expenditure and the [C+G] expenditure, the change in RER is given by Figure 5. Interestingly, the changes in RER coincide with the changes in the overall level of GDR expenditure, also shown in Figure 5.¹¹ Moreover, the overall shifts in the structure of the (relative) expenditure also coincide with the major changes in industrial production, sales and profits shown in Figure 2. Taken together, this seems to show the importance of studying the structure of production.

Figure 5
Change in RER (left axis), GDR, and GDP (right axis),
Japan 1991-2000, percent



¹⁰An important distinction may also be made between different stages of production. The analysis offered by the Austrian business cycle theory (ABCT) also is highly relevant for assessing the causes of the occurrence of the economic problems in Japan in the first place. Following Mises (1912), the ABCT shows how officially and newly created money and credit inflation without real backing creates a boom—a boom that necessarily must end in a bust as the money is wiped out. See Mises (1936) for a short version. I would also like to mention the analysis of Japan put forward by Bonner (2003), particularly the demographics.

¹¹There is no circular reasoning here, since there is nothing that logically says that the relation between the parts of the whole has to have anything to do with the change in size of the whole itself. I've included figures on GDP just to show how the changes in RER seem to predict changes in GDP as well. Since RER is based on GDR, this could be seen as yet another argument in favor of the use of GDR over GDP.

This concludes the interpretation of the events from what basically is an Austrian perspective. Regardless of the underlying reasons, the fact that prices did fall during the 1990–2001 period seems to have been something good *per se*. This brings us to the official Japanese interpretation of the event.

OFFICIAL JAPANESE INTERPRETATION

The great concern about falling prices and deflation did not start until 1995. The fall in CPI by 0.1 percent of this year was the first recorded decline since the current statistical survey began in 1970.¹² It might prove useful to contrast the official view on this topic with the findings in the paper. This may be done by simply studying the monetary and fiscal policy measures taken by the BoJ and other official agents during the 1990–2001 period in response to what they perceived was going on in the country. Before doing that, it is important to note that some mainstream economists claim that prices could fall because of increased productivity, i.e., due to positive “productivity shocks” and consequent “output gaps.” Thus, one would at least expect to find some discussions on this possible cause of the falling prices of 1995 in the official records.¹³

To gain a deeper understanding of what kind of reasoning these economists used to base their actions on (Figure 1 above), the BoJ’s *Quarterly Economic Outlook* for 1995 could be a useful source. In the February issue, it is stated that “prices will be stable,” the decline in year-to-year domestic wholesale prices “will become smaller,” and that “the rate of increase in consumer prices may virtually stop dwindling” (see Table 1 above). The outlook ended by noting that “in sum, Japan’s economy will probably continue to recover.” Hence, in February, the BoJ seemed rather optimistic and this view comes from, among other things, the fact that it believed producer prices would stop falling and consumer prices would stop increasing at such a slow rate.

In the May issue, it states that it appeared

domestic wholesale prices have now stopped declining but are likely to go down again. The year-to-year increase in consumer prices will stay about zero as the increase in cheap imports will exert downward pressures on consumer prices, the so-called “price destruction” phenomenon.

The BoJ continued by stating that, “in sum, . . . moderate economic recovery has been under way in Japan. . . . In these circumstances, the Bank of

¹²See BoJ (2000).

¹³However, this view should not be mixed with the idea of growth deflation (increasing aggregate supply) discussed above since increased productivity need not materialize into new goods and services. Historically, some of this increasing productivity has made it possible to afford more spare time.

Japan . . . lowered the official discount rate by 0.75 percent points to 1 percent, on April 14.” Hence, in May, the BoJ seems to have believed that falling prices were so destructive as to prompt it to cut interest rates.

In the August issue, the BoJ started by noting that “economic recovery has paused in Japan despite expansionary forces that underlie the economy.” Furthermore, “prices are expected to continue a weak trend owing to the weak economic recovery” and “the declining trend of domestic wholesale prices is expected to persist while consumer prices are also forecast to decrease somewhat year to year.” And, in conclusion, “in these circumstances, the Bank of Japan, [having considered] the influence that an excessive decline in prices may have on the economy,” soon again lowered the discount rate down to 0.5 percent in September. “The effects of these monetary policy actions, combined with the easing in March and April 1995, are expected to contribute to the sustainability of economic recovery by stimulating demand,” the report ended. Thus, in August, it expressed the idea that price increases signal a strong economy, and *vice versa*, and that the prospect of deflation needed to be combated by further rate cuts.

In the November issue, the BoJ started by noting that “the pause in Japan’s economic recovery continues.” It continued by noting that,

in addition, the “Economic Measures Toward Steady Economic Recovery,” announced on September 20, 1995 will add a substantial amount of public-sector investment and is expected to contribute significantly to the upturn of the economy in early 1996. Housing investment is also expected to recover in the fourth quarter of 1995 against the background of low interest rates.

It also declared that “prices are expected to remain unchanged or decline marginally.” In November, once again it believed that prices were failing to rise because the economy had paused, and was in desperate need of some Keynesian-style stimulation.

Hence, from the 1995 *Quarterly Economic Outlook* we conclude that the BoJ clearly expressed a fear of falling prices. Moreover, we conclude that it truly believed that typical Keynesian measures like increasing public consumptive expenditure (although it might be called investment), lowering interest rates, and creating more money to increase private housing consumption (although they might call this also investment) would be enough to turn the economy around.¹⁴ They clearly relied on the GDP measure, and its focus on consumption expenditure, as an indicator of whether the economy was doing well or not. Finally, the BoJ did not take falling prices and a stable or increasing nominal GDP, i.e., a rising real GDP, as a good sign; the fear of falling prices seems to have hidden this fact. There was no discussion about any possibility of “productivity shocks,” even though it was a fact that the BoJ’s own

¹⁴See for example Herbener (1999) or Powell (2002) for more on the Keynesian and Monetarist interpretation of the Japanese economy.

Tankan index was rising, as were industrial production and profits. Thus, it appears the BoJ even ignored some of the mainstream ideas on productivity-induced fall in prices. It appears to have believed simply that rising prices were good, falling prices bad.

In sum, it appears that it was the possibility of a fall in consumer prices *per se* that caused these concerns, because the size of the fall itself was close to zero (0.1 percent). This has deftly been named *apoplithorismosphobia*, or deflation-phobia, by Thornton (2003).¹⁵

This interpretation of the situation stands in sharp contrast to the interpretation outlined above. (We grant the fact that the BoJ did not have the possibility of hindsight as we did.)

CONCLUDING REMARKS

What consequences might one expect from the official measures taken, based on the official interpretation? If deflation really were benign for the economy at large (except for confiscatory deflation), then we might expect that any measures taken to prevent prices from falling would be less than benign. Most of the official measures taken have been aimed at keeping up the growth in money supply, in aggregate demand, and the level of price inflation.

The result? It appears the official measures have been quite successful in their mistaken attempt to improve the economic situation. Indeed, more money has been spent and things have generally become more expensive. But if there were one thing most economists would agree on it would probably be that Japan's economic malaise is not over. There seems to be an important lesson for the future: Preventing a free-market adjustment to changing circumstances, including deflation, can prevent or prolong a recovery. Similar policy measures are most likely to fail in the future as well, despite the advice of some famous mainstream economists.¹⁶

As Mises showed so long ago, government intervention in the economy tends to cause unintended problems, problems that later are used as excuses for further interventions. However caring and intelligent the individuals within the official bureaucracy, the ideas they base their decisions on appears not to measure up to any reasonable standards. Unfortunately, until a change of ideas occurs, the economic malaise of Japan is likely to continue.

¹⁵Another example of this would be Federal Reserve (2002a).

¹⁶According to Reuters on April 14, 2003, Nobel Laureate and former World Bank chief economist Joseph Stiglitz the same day said "the Japanese government could stimulate domestic demand by printing money, in a form similar to U.S. Treasury paper." That is, above the money printing conducted by BoJ. According to popular economist and *New York Times* columnist Paul Krugman (1998a, 2001, and 2003), the problem is too little spending regardless of what kind, so that the spending undergone in connection to the destruction of skyscrapers or even of war is good for the economy.

APPENDIX

For those familiar with the system of national accounting, it is known that to obtain the Gross Domestic Product (GDP) from the Net Domestic Product (NDP), the depreciation of fixed assets is added. If NDP is given by:

$$\text{profits} + \text{wages} = \text{NDP} = C + I + G + \text{NX} \quad (\text{A1})$$

where C is private consumption, I net investments, G public consumption and NX net exports (i.e., exports-imports), GDP is given by:

$$\text{profits} + \text{wages} + \text{depr. of fixed assets} = \text{GDP} = C + I + G + \text{NX} + \text{depr. of fixed assets} \quad (\text{A2})$$

On the other hand, GDR is obtained by adding business costs in accordance to the income statements of the period at hand. This means that, since profits + business costs = sales revenue, the counterpart of the left hand side of A2 becomes sales revenue + wages. This seems intuitively very appealing as a measure of gross income during a period, and certainly more intuitively appealing than the profits + wages + depr. of fixed assets of the GDP measure.¹⁷ Thus, GDR is given by:

$$\text{sales revenue} + w = \text{GDR} = C + B + G + \text{NX} \quad (\text{A3})$$

where B is the productive expenditure, corresponding to (i) gross investment in fixed assets, (ii) gross investment in inventories and work-in-progress, and (iii) current productive expenditure.¹⁸

The Economic and Social Research Institute (ESRI), Cabinet Office, Government of Japan, publishes sufficient data for the computation of GDR. The result is shown in Table A1.

¹⁷Furthermore, it could be argued that in national accounting, either you should use a measure containing only gross terms (a gross measure), or a measure containing only net terms (a net measure). There is no justification for the use of a measure that contains a mix of net and gross terms (a gross/net measure). The fact that the alleged gross measure of GDP contains a net term, net investment in inventories, seems to make it a totally flawed, gross/net measure. This is not the same as saying that GDR is the ultimate measure, though.

¹⁸For more on this, see Reisman (1996), p. 702.

Table A1
Japanese NDP, GDP and GDR, 1990-2001, Billion Yen

Year	NDP	GDP	GDR (1) + (2) (3) + (4)	(1) Private Consumption	(2) Public Consumption	(3) Productive Expenditure	(4) Net Exports
1990	370,277	439,482	1,164,581	234,280	58,870	825,567	45,863
1991	394,204	470,160	1,230,394	247,568	62,603	873,556	46,668
1992	400,632	482,369	1,247,172	258,035	66,163	875,687	47,288
1993	401,101	485,704	1,234,720	264,156	69,183	857,272	44,109
1994	402,904	489,580	1,244,832	272,636	71,389	856,538	44,270
1995	405,950	494,900	1,270,744	276,836	74,729	873,950	45,230
1996	416,112	508,163	1,306,617	283,382	77,557	896,117	49,561
1997	424,313	518,547	1,343,115	288,808	79,163	919,069	56,074
1998	416,429	512,578	1,313,366	288,103	80,795	889,417	55,051
1999	410,211	505,892	1,287,845	286,583	82,895	867,224	51,144
2000	410,423	508,264	1,307,874	285,808	85,997	880,814	55,256
2001	401,878	500,972	1,296,380	286,240	88,098	869,475	52,567

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