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1. Introduction

In my previous paper (Amano 2004) I attempted to estimate the NAIRU (Non-Accelerating-Inflation Rate of Unemployment, which is synonymous with the natural rate of unemployment) and potential output for postwar Japan, 1950–2002, using annual data. In that paper, I left the following three points for future work. Those are (a) to examine the relative merits of using, as a generator of inflation, either the GDP deflator, the consumer price index, or the wholesale price index; since potential output is a concept relating to GDP, a reasonable choice would be the first one, but one may need a formal criterion for comparing among the three indexes, (b) to endogenously estimate error variances of an observation equation and a transition equation (or transition equations) of Kalman–filter models, and (c) to handle the

1) The two terms are used in different contexts; the former is used in the context of anti-inflation policy while the latter mainly in a discussion of the shape of Phillips curves. See Johnson and Layard (1986) for a detailed discussion, particularly, determinants and international differences, of the natural rate of unemployment.
quarterly data, which will facilitate the work mentioned in point (b).

The main purpose of this paper, which is a sequel to Amano (2004), has two components: The first is to estimate the NAIRU and potential output in postwar Japan, U.S.A., and U.K. The second task is to estimate Okun's law for the three countries. Okun's law has several versions, each having slightly different interpretations. The original version says that a one–percentage–point decrease (from a natural unemployment rate) in the observed unemployment rate raises a 3\(^{-}\) (or 3.2\(^{-}\)) percentage–point increase in the relative excess of actual output over potential output. See Okun (1962). This relationship can be written as

\[
(po' - yr)/yr = 3(ur - 0.04), \tag{1}
\]

or alternatively,

\[
(yr - po')/po' = -3(ur - 0.04) \tag{1'}
\]

where \(po'\) is potential output (potential GDP), \(yr\) is actual output (real GDP), \(ur\) is the actual unemployment rate (expressed as a fraction). A fraction 0.04 is a natural rate of unemployment (a NAIRU) assumed in (1), which is, actually, not constant over time as well as cross–sectionally. Number 3 in (1) is a hypothetical level and what is called the 'Okun coefficient,' which will also be variable depending on the time and economy in question. Equation (1) is the original form that Okun proposed, while (1') is a form shown in Hall and Taylor.

2) See Kim and Nelson (1999) for a comprehensive discussion and applications of Kalman–filter models or, more generally, state–space models.
(1997). In this paper I use the second form because the base to measure the gap rate would better be $po'$ rather than actual $yr$. However, the difference between (1) and (1') is quite small because the left-hand side of (1) is nearly equal to $\ln(p0'/yr)$ while that of (2) is nearly equal to $\ln(yr/p0')$, and $\ln(p0'/yr) = -\ln(yr/p0')$, where $\ln$ stands for the natural logarithm. Our estimation here targets the NAIRU and potential output, hence combining the two estimates will give the Okun coefficient (assumed to be 3 above) in the three countries for the period 1951 through 2002. Also, I use annual data because of the continuity with my previous study and because of a new method of giving appropriate exogenous error variances while referring to a variant of Okun's law due to Blanchard (1997), which uses observable variables on both sides of the law. In other words, I use sample standard deviations in Blanchard's Okun relation, which are observable, as criteria for deciding error variances in our Okun relations, which are made up of unobservable variables.

The next section (Section 2) presents a general framework for estimating the NAIRU and potential output. Then, the estimating procedures and comparative interpretations follow, where use is made of the GDP deflator as the price index. Next, I use the results regarding the NAIRU and potential output to derive Okun's law for the three countries. Section 3 concludes, which is followed by an examination similar to the text when the price level is the consumer price index, and also descriptions of the data used.

I first reproduce from my previous paper the two basic relationships for deriving the NAIRU and potential output, which are variants of the 'expectation-augmented' Phillips curve. The first one involves the NAIRU, \( n_{ur} \), as a state (unobservable) variable and is written as:

\[
p_t = a_1 (n_{ur,-1} - ur_{-1}) + p_t + a_2 (gimp_t - gimp_t) + u_t, \quad u_t \sim \text{i.i.d. } N(0, \sigma_u^2),
\]

\[
n_{ur} = g_{t-1} + n_{ur,-1} + v, \quad v_t \sim \text{i.i.d. } N(0, \sigma_v^2),
\]

\[
g_{t} = g_{t-1} + w, \quad w_t \sim \text{i.i.d. } N(0, \sigma_w^2),
\]

where \( p_t \) is the rate of inflation of either the GDP deflator or the consumer price index. Results of my previous paper suggest the wholesale price index is not an appropriate variable that measures the changes in the whole demand and cost pressures of the economy. Hence I examine the two systems corresponding to the above two price indexes. \( n_{ur,-1} \) is the NAIRU in year \( t-1 \), \( ur_{-1} \) is the actual (observed) rate of unemployment, so that \( n_{ur,-1} - ur_{-1} \) expresses excess demand for aggregate labor force. Also, \( p_t \) is the expected rate of inflation, which is an estimated value of a regression of \( p_t \) on \( p_{t-1} \), \( p_{t-2} \), \( p_{t-3} \), and a constant. \( p_t \) is a rationally expected inflation (see Amano 2003; Maddala 2001). \( gimp_t \) is the rate of inflation of the import price index, and \( gimp_t \) is the expected value of \( gimp_t \), which is derived in the same way as \( p_t \).

The second equation in (2) shows that \( n_{ur} \) takes a random walk with a drift \( g_{t-1} \). This equation allows the drift to take a pure random walk (the third equation). But the second equation includes the case
of *nur*, taking a pure random walk, where \( g_{t-1} \) is identically zero, as well as the case of a constant drift, where \( g_{t-1} \) takes on a non-zero constant.

\( nur_{t-1} \) is called the state (unobserved) variable; \( ur_{t-1} \) and \( gimp_t \) are called the observed variables (data). Also, the first equation is called the observation (measurement) equation, while the second and third equations are called the transition equation. ‘i.i.d. \( N(\cdot) \)’ on the right-hand side implies that each error term is distributed as an independent and identical normal.

The second system which represents another ‘expectation-augmented’ Phillips curve is composed of:

\[
\begin{align*}
  p_t &= b_1(l_{y_{t-1}} - p_{o_{t-1}}) + p_{r} + b_2(gimp_{t} - gimp_{r}) + x_{t}, x_{t} \sim \text{i.i.d. } N(0, \sigma_x^2), \\
  p_{o_{t}} &= h_{t-1} + p_{o_{t-1}} + y_{t}, y_{t} \sim \text{i.i.d. } N(0, \sigma^2), \\
  h_{t} &= h_{t-1} + z_{t}, z_{t} \sim \text{i.i.d. } N(0, \sigma^2),
\end{align*}
\]

(3)

where \( l_{y_{t-1}} \) is real GDP in year \( t-1 \) in natural log, and \( p_{o} \) is potential output also in natural log. All the other corresponding variables have similar meanings to those in (2). Here the state variable is \( p_{o_{t-1}} \); and \( l_{y_{t-1}} - p_{o_{t-1}} \) represents excess demand for aggregate commodities.

Based on the basic frameworks described above, I now estimate the two state variables of Japan, the U.S.A, and the U.K., using annual data for 1951 through 2002. When I tried to estimate two or three error variances in (2) or (3), they were not obtained with significant \( z \) ratios within our current model settings. Hence I need to give them exogenously. Here, Blanchard (1997)’s version of Okun’s law can conveniently be called on. Blanchard’s version is written as

(239)
\[ ur_t - ur_{t-1} (\equiv \Delta ur_t) = -a (gy_t - c) \]

or

\[ gy_t - c = -(1/a) (ur_t - ur_{t-1}), \tag{4} \]

where \((1/a)\) is the Okun coefficient, and a constant \(c\) is what he calls a normal growth rate of output required to sustain a constant unemployment rate over time. In other words, Blanchard uses the growth rate of real GDP, \(gy\), minus a constant \(c\) for the relative output gap (compare to \((1')\)), and the first difference of the unemployment rate for the difference between the actual rate of unemployment and its natural counterpart. Then, as long as \(c\) can be seen as a constant, one has

\[ sd (\text{relative output gap in } (1')) = sd (gy), \]

and

\[ sd (ur - nur) = sd (\Delta ur), \]

where subscript \(t\) is omitted from now on, and \(sd\) means a sample standard deviation. Note in the above that left-hand sides involve unobservable variables, while the right-hand sides only observable variables. Then the standard deviations on the right-hand sides will make useful clues to decide error variances of equations (2) or (3) which involve the variables appearing on the above left-hand sides.

I shall develop the following discussion first using the GDP deflator as a generator of inflation, and next, briefly, using the consumer price index as an inflation generator in an appendix.
2-1 The NAIRU and Potential Output using the GDP Deflator

To deal with the Japanese Phillips relationship involving unemployment gap (2), I first conduct the Augmented Dickey–Fuller test with a null hypothesis ‘$\Delta urj$ has a unit root.’ The test statistic is $-2.579$, while the 1% significance level is $-3.563$; the 5% level is $-2.919$; and the 10% level is $-2.597$. Hence the null cannot be rejected at the 10% level (which, of course, does not necessarily mean $\Delta nurj$ has a unit root). A letter j or J (a or A; b or B) attached to constants or variables means it pertains to Japan (the U.S.A., the U.K., respectively). I tried in (2) the case where the first transition equation has a constant drift $a_j(3)$ and the case where it has a random-walk drift. In terms of the maximized log-likelihood, Akaike information criterion, and Schwartz criterion, the former turns out having a better fit.

Regarding $sd(\Delta urj) = 0.0028$ as a reference value in choosing $\sigma^2$, while making $sd(\Delta urj = nurj)$ as close as possible to $sd(\Delta urj)$ (because of the correspondence between our formulation and Blanchard’s), I set $\sigma^2 = 10E-5$ and $\sigma^2 = 10E-5(\sigma = 0.0032)$.

Then, the maximum-likelihood method yields

$$a_j(1) = 9.906(12.970), \ a_j(2) = 0.120(8.671), \ a_j(3) = 0.001(2.059),$$

and also, $sd(\Delta urj = nurj) = 0.0025$, which is reasonably close to $sd(\Delta urj)$ that is 0.0028. Note here that nurj is an estimated series. The numbers in the parentheses above are $z$ ratios, i.e., the estimated coefficients divided by their standard errors when standardized coefficients have a normal distribution. The graphs of the estimated nurj and actual urj are shown in Figure 1.

Turning to the U.S. case, the Augmented Dickey–Fuller statistic for
the null that $\Delta ura$, i.e. the annual difference in U.S. unemployment rate $ura$, has a unit root is $-6.166$ (the three critical values are the same as in Japan). Hence the hypothesis is rejected at the 1% level. Setting $\sigma_i^2=10E-5, \sigma_j^2=11*10E-5$ so that $\sigma_i=0.0105$, and assuming a constant drift $a_A(3)$, model (2) for the U.S. economy is computed as

$$a_A(1)=0.712(37.887), a_A(2)=0.054(14.506), a_A(3)=0.007(2.182).$$

Also, $sd(ura-nura)=0.0105$ correctly hits $sd(\Delta ura)=0.0105$, where $nura$ is the U.S.'s NAIRU (natural unemployment rate); recall the cor-
respondence between our formulation of Okun’s law (1') and that of Blanchard (4). The U.S. NAIRU and \( u_r a \) are shown in Figure 2.

I next examine the U.K. economy. The Augmented Dickey–Fuller test statistic for the null that the annual difference in the unemployment rate \( u_r b \) has a unit root turned out to be \(-4.843\), so the null can be rejected in any significance level. Here also, I first tried a constant drift term, using the second error standard deviation which has a comparable size to \( s_d (u_r b - n_u r b) \), where \( u_r b \) and \( n_u r b \) are the British counterparts of actual and natural unemployment rates, respectively. But then, significant coefficients were not obtained. Hence I next as-

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**Figure 2** The U.S.'s Natural and Actual Unemployment Rates

![Graph showing the U.S.'s Natural and Actual Unemployment Rates]
sumed a system (2) with a stochastic drift, for $\sigma_\beta^2=10\times 10^{-5}$, and $\sigma_\epsilon^2=10\times 10^{-4}$ (and $\sigma_\epsilon=0.0100$). The coefficients are estimated as

$$a_B(1) = 2.877(11.809), \quad a_B(2) = -0.130(-3.290),$$

and also $sd(urb-nurb)=0.0105$, which seems close enough to $sd(\Delta urb)=0.0098$. The evolutions of $nurb$ and $urb$ are shown in Figure 3.

Let us next turn to equations system (3) which expresses inflation as arising from the relative gap (excess demand) for commodities and inflation expectations. For this case, I choose the two error variances such that the second standard error in (3) has a similar size to the
standard deviation of GDP growth rates, and also that of output gap has a similar size to the standard deviation of GDP growth rates. The second criterion is due to the correspondence between our and Blanchard’s Okun law.

Starting with the Japanese economy, the Augmented Dickey–Fuller test statistic of $\Delta lyj$ for the null hypothesis of a unit root is $-2.511$, so it cannot be rejected. I assume a constant drift term for the first transition equation, and set $\sigma_3^2=8\times10^{-5}$, $\sigma_5^2=1.5\times10^{-3}$ so that $\sigma_7=38.7\times10^{-3}$. Then the maximum-likelihood estimation using system (3) yields

$$b_{1}(1)=0.611(10.520), \ b_{2}(2)=0.079(5.429), \ b_{3}(3)=0.052(9.134).$$

Also, $sd(lyj-poij)=0.0414$, while $sd(gyj)=0.0402$, where $gyj$ is the annual growth rate of real GDP, $yj$. The two $sd$’s are considerably close to each other. Note incidentally that $sd(lyj-poij)=0.0414$ implies that, on average, real output diverges from its potential level by $4.1\%$. Potential and actual output, $poij$ and $lyj$, are drawn in Figure 4.

To examine the U.S. case, I first obtain the Augmented Dickey–Fuller statistic, which is $-7.085$, so that the null hypothesis for a unit root is rejected even at the $1\%$ level. I assume a constant drift $b_{4}(3)$ for the first transition equation and choose $\sigma_5^2=1.5\times10^{-5}$, $\sigma_7^2=10^{-4}$, hence $\sigma_7=0.01$. Using those error variances, the system (3) yields

$$b_{4}(1)=0.343(23.162), \ b_{5}(2)=0.040(8.357), \ b_{6}(3)$$

$$=0.032(38.676).$$

Then, $sd(lya-poai)$ is computed to be $0.0239$, which is quite close to $sd(gya)=0.0235$, where $gya$ is the growth rate of U.S.'s output (real
GDP). The first standard deviation implies that real GDP deviates from its potential by 2.4% on average. The evolutions of poa and ly over the sample period are shown in Figure 5.

The derivation of potential output for the U.K. proceeds in a similar manner. The test statistic of gyb for a unit root test turns out as $-5.509$, where gyb is the growth rate of Britain’s GDP; hence the null hypothesis can be rejected at the 1% level. Referring to $sd(gyb) = 0.0193$, I choose $\sigma^2 = 2 \times 10^{-5}$, $\sigma^2 = 3 \times 10^{-4}$ ($\sigma = 17.3 \times 10^{-4}$), with a constant drift term $b_\theta(3)$. The results turns out as

(246)
Figure 5  The U.S.'s Potential and Actual Output

\[ b_B(1) = 1.525(17.236), \quad b_B(2) = -0.150(-6.395), \quad b_B(3) = 0.024(11.950). \]

The standard deviation of Britain's real growth rate \( sd(\text{gyb}) \) is 0.0193, while the standard deviation of her output gap \( (\text{lyb} - \text{pob}) \) equals 0.0199, showing that they are close to each other. The latter also means that Britain's actual output deviates from her potential by 2% on average. Potential and actual output is drawn in Figure 6.
2-2 Okun's Law in terms of the GDP Deflator

Let us now derive Okun’s law for the three countries. Writing $dur_j = ur_j - nur_j$ and $dy_j = ly_j - poi_j$, where the former (unemployment gap) is the excess supply of labor, while the latter (output gap) is the excess demand for output, the Okun coefficient can be derived as $-c_i(1)$ of the following OLS estimate

$$dy_j = c_i(0) + c_i(1)dur_j + e,$$

where I assume that the error term $e$ satisfies the usual requirements. In the following I omit writing estimated values of constant terms,
although they are always present in the estimation. The result for Japan is

\[ c_I(1) = -14.276(-26.239), r^2 = 0.931, DW = 1.709, \]

where the number in parentheses on the right-hand side is the \( t \) ratio, \( r^2 \) is the coefficient of determination adjusted for the degree of freedom, and \( DW \) is the Durbin–Watson ratio. Here the Okun coefficient is 14.276. The law along with a regression line is depicted in Figure 7.

The U.S.’s Okun law is derived by regressing \( dya = lyb-po \) on a constant and \( dura = lya-po \). The result turns out as

\[ c_A(1) = -2.214(31.797), r^2 = 0.952, DW = 2.260. \]

Hence the U.S.’s Okun coefficient is 2.214. The relationship is drawn in Figure 8.

Finally, the U.K.’s counterpart obtains from the regression of \( dyb = lyb-po \) on \( durb = urb-nurb \) as well as a constant. One then obtains

\[ c_B(1) = -1.903(-117.351), r^2 = 0.996, DW = 2.478. \]

The U.K.’s Okun coefficient is therefore 1.903. See Figure 9 for the U.K.’s Okun relationship.

It is of some interest to refer to the Okun coefficients which are derived in some other studies. Hamada and Kurosaka (1984) compute Japan’s coefficients for three subperiods between 1953 through 1982, which are 18, 32, and 13, the weighted average of which amounts to 21. They also derive the coefficient for the U.S.’s same time period, which is 2.36. The big difference in the coefficients between Japan and other countries is, according to them, due to the different re-
response of (average) labor productivity following a one-percentage decrease in unemployment. Blanchard (1997) derives the coefficients for the U.S., the U.K., and Japan, among others. As was described in (4) above, he uses output growth in excess of the normal growth rate $c$ (which he regards to be $3\%$) in place of output gap, and the difference in the unemployment rate from the last year in place of the unemployment-rate gap. His estimated coefficients are, on average over two subperiods for 1960 through 1994, 2.35 for the U.S.A., 4.37 for the U.K., and 5.75 for Japan. He attributes the larger coefficients in Japan and the U.K. to social or legal obstacles to firms' employment adjust-
Figure 8 The U.S.'s Okun Relationship

Comparing our estimates and those of the preceding authors, for the Japanese economy, ours is located in between those of Hamada-Kurosaka and Blanchard. For the U.S.A., the three estimates are close in size. The U.K.'s coefficient in Blanchard (1997) is larger than twice the size of ours. Note should taken here that, in those studies, the estimation periods are different, some of which must involve drastic structural changes such as the collapse of the bubble in the Japanese economy in the early 1990s.

As is recognized by Hamada-Kurosaka and Blanchard, the Okun co-
efficient seems to be changing over time. Further inquiries into the size and international difference of the coefficient as well as its stability (or instability) over time seem to be the subjects waiting for our next investigation.

3. Conclusions

It will be in order and convenient to summarize our discussion and consider future direction of inquiry. The main task before me was the estimation of the NAIRU, potential output, and Okun's law for the three countries, Japan, the U.S.A., and the U.K. The derivation of the
Okun coefficient depends on the error variances one assigns to the observation equation and transition equation(s) in equation systems for the Kalman filter. Hence I invoke Blanchard's (1997) version of the law, which comprises observable variables (the yearly increment of unemployment rate and yearly growth rate of output). I chose the two variances referring to (a) the standard deviations of the increment of unemployment rate and (b) the standard deviations of output growth, such that the standard deviation of our estimated unemployment-rate gap becomes nearly equal to (a), and that of the estimated output gap is nearly equal to (b). Our devices are essentially for standardizing the three country results and for making the Okun coefficients comparable among them.

It will be plausible to assume the Okun coefficients to be variable over time, just like I started this research by the thought that the NAIRU (natural rate of unemployment) is not constant. Estimating the variable coefficient version might be well within our reach with the use of Kalman filtering.

It will also be our next needed task to give economic explanations to the difference of the coefficients in various countries as well as to the levels and changes of the NAIRU. These aspects of future work seem much harder for us because they must involve legal and institutional (or even cultural) considerations of the product and labor markets in the economies under consideration.

Appendix: The NAIRU, Potential Output and Okun's Law for Consumer Price Indexes

Here I start with Japan's Phillips curve involving unemployment
gap that expresses excess demand pressures. Note, through this appendix, that the price level is measured by the consumer price index. Trying to make \( sd(\text{urj} - \text{nurj}) \) and \( \sigma_r \) close to \( sd(\Delta\text{urj}) \) which is 28*10E-4, I choose \( \sigma_r^2 = 2*10E-5 \) and \( \sigma_y^2 = 10*E-5 \). Then, \( \sigma_r = 32*10E-4 \).

Using those error variances along with a constant drift term, I run equation (2) and obtain \( sd(\text{urj} - \text{nurj}) = 29*10E^{-4} \). The last standard deviation is reasonably close to \( sd(\Delta\text{urj}) \) as well as to \( \sigma_r \) (of course, those two need not be very close because the former concerns the difference in actual unemployment rates, while the latter concerns the difference in NAIRUs). All the computations in this appendix yield statistically significant coefficients at least at the 10% level except Britain’s \( b_n(2) \).

Turning to equation (3), Japan’s Phillips curve regarding the output gap is computed using two error variances \( \sigma_y^2 = 2*10E-5 \) and \( \sigma_r^2 = 2*10E-3 \). Here, \( \sigma_r = 0.447 \). The standard deviation of the output gap is \( sd(\text{ly} - \text{poy}) = 0.0438 \), which is not very far from \( sd(\text{gy}) (= 0.0402) \).

As in the text, the Okun coefficient can be extracted from the regression of the output gap on the unemployment rate gap and a constant. It turns out as \(-c_{1}(1)=14.646 (-33.098), r^2=0.955, DW = 1.825\).

The U.S. Phillips curve involving the unemployment-rate gap is derived using \( \sigma_y^2 = 2.5*10E-5 \) and \( \sigma_r^2 = 10*E-5 \) (\( \sigma_r = 32*10E-4 \)). The resulting \( sd(\text{ura} - \text{nura}) = 0.0106 \), while \( sd(\Delta\text{ura}) = 0.0105 \). The U.S.’s another Phillips curve featuring the output gap has the error variances \( \sigma_y^2 = 10E-5 \), \( \sigma_r^2 = 55*10E-5 \) (\( \sigma_r = 0.0235 \)). The estimated \( sd(\text{lya} - \text{poy}) = 0.0251 \) while \( sd(\text{gya}) = 0.0235 \). The last three magnitudes seem close enough to one another. The Okun coefficient can be given as \(- \)
\[ c_A(1) = -1.898 \times (-9.587), r^2 = 0.641, DW = 2.196. \]

The U.K.'s Phillips curve based on the unemployment gap, with a constant drift and plausible sizes of error variances, was not obtained with statistically significant coefficients. Hence I tried a random-walk drift in this Phillips curve, see equation (2). Here, I posit \( \sigma_u^2 = 2 \times 10^{-5}, \sigma_y^2 = 10^{-4} \), and \( \sigma_o^2 = 6 \times 10^{-4} \) \( (\sigma_e = 0.01) \), while \( sd(\Delta urb) = 9.8 \times 10^{-3} \). Then the estimation gives \( sd(urb - nurb) = 0.0141 \), which is not close to \( sd(\Delta urb) = 9.8 \times 10^{-3} \). However, the probability that \( c_b(2) \) takes a wrong sign is 0.129. If one assigns a smaller value to \( \sigma_y^2 \) to make \( sd(urb - nurb) \) closer to \( sd(\Delta urb) \), then the above probability becomes larger, making \( c_b(2) \) less significant. Hence I use the above error variances. For another Phillips curve using the output gap, I can use a constant drift. The error variances are \( \sigma_y^2 = 7 \times 10^{-5} \), and \( \sigma_o^2 = 3.5 \times 10^{-4} \) \( (\sigma_e = 18.7 \times 10^{-3}) \). The resulting standard deviation of output gap is \( sd(lyb - pob) = 0.0193 \) which exactly equals \( sd(gyb) \). The Okun coefficient then is given as \( -c_b(1) = -1.361 \times (-57.200), r^2 = 0.985, DW = 2.468. \)

Comparing the two sets of Okun coefficients involving different price indexes, Japan and the U.S. have considerably similar size, while the U.K.'s coefficient using the consumer price index is much smaller than that using the GDP deflator. For the moment, it would be safe to pay main attention to the results in the text, because the consumer price index covers only part of the aggregate commodity bundle which comprises the whole gross domestic products.

**Appendix: Data Sources**

The data on Japan were derived from *The National Income Accounting* (255).
Annuals, Economic Planning Agency (for nominal and real GDP); The Monthly and Annual Statistics on Price Indexes, the Bank of Japan (for the domestic wholesale price index); The Consumer Price Index Annuals, the Management and Coordination Agency (for the consumer price index); The Labor Force Survey Report, the Management and Coordination Agency (for the unemployment rate)

All the data relating to the U.S.A. and the U.K. draw on International Financial Statistics Yearbooks, International Monetary Fund.

References


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