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C06, Fall 1999
September 27

Lecture #2: Notes on Exchange Rates

1. Exchange Rates

   (a) Definition: spot exchange rate, s = units of domestic currency needed to buy one unit of foreign currency. Appreciation: $s \downarrow$, Depreciation: $s \uparrow$. This is the usual definition of s, although sometimes s = units of foreign currency per unit of domestic currency.

   (b) They move around a lot!

      i. Example 1: US dollar, Japanese Yen (see attached figure)[1] During 1982-1985, exchange rate was roughly $s = 250$ yen per dollar, after which the dollar depreciated significantly. This is tough on foreigners exporting to the US. Consider a car manufacturer whose costs of making one car is $C = 2$million yen. Suppose the manufacturer was making 10% profits, i.e., charging 2.2million = (1+m)C, with $m = 0.10$. The price in the US of the car is $P^{US} = (1+m)C/s = \$8,800$. Now, in the (brief!) period, 1985-mid 1986, the dollar depreciated (Yen appreciated) to 150 yen per dollar. The manufacturer has a couple of choices:

         A. keep the profit margin unchanged and charge $(1+m)C/s' = \$14,667$. In this case, the Japanese car maker can expect to lose a lot of market share in the US.
         B. keep the US price unchanged. But, then Japanese revenues are \$8,800×150 = 1.32million yen. This does not even cover costs, and implies a negative profit margin, as the following algebraic expression shows:

$$\frac{sP^{US}}{C} - 1 = m.$$

         Both margins hurt the exporters. As it turned out, the Japanese raised US prices only a little. This did not cost them much market share because US automakers raised prices too. It did not cost a lot in terms of profit margins because of two reasons. First, the Japanese found ways to cut costs. Second,

[1] Discussion taken from Backus and Roubini's new book, to be found at http://equity.stern.nyu.edu/~nroubini/NOTES/CHAP7.HTM#topicx

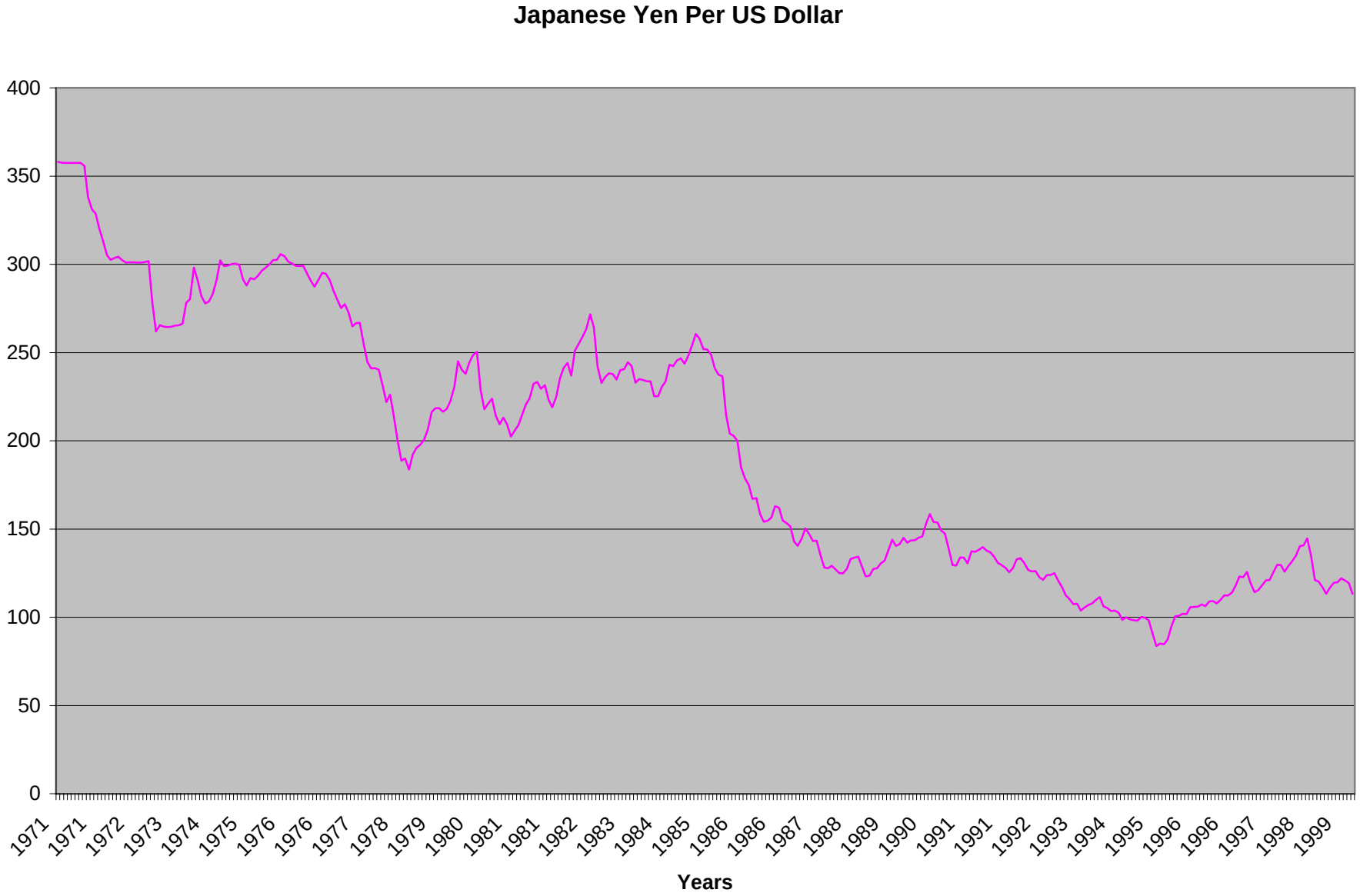
they actually started out the period with very high profit margins (perhaps as high as 50%) due to the effects of the appreciating dollar that preceded 1982 (see attached figure, and note how the previous formula implies that m is increasing in s.)

ii. Example 2: Asian 'Crisis Country' Currencies.
Data on South Korea, Indonesia, Malaysia, and Thailand are attached. In each case, data on exchange rates, the trade balance, and production are presented. The pattern is the same in each: in late 1997 there was a massive, sudden devaluation. This is associated with a sharp swing in the trade balance from deficit to surplus and a fall in industrial production. A simplistic interpretation of the events is that, until the crisis, foreigners were happy to finance trade deficits by accumulating the assets of these countries (i.e., direct investment, loans, etc.). Then, for reasons to be discussed more later in the course (see especially the Krugman book), foreigners didn't want to do this anymore. They didn't want to accept the currencies of these countries, because they lost confidence in the value of the assets they could buy with them. When this happened, these countries stopped being able to import. That's why their trade balances turned around and went into surplus. Meanwhile, production fell dramatically in these countries. This was in part because production depends on being able to import intermediate goods, and imports were sharply curtailed. In addition, many firms need access to loans in order to produce. The huge fall in the currency values reduced their ability to get these loans. In part this was because many firms (perhaps believing their governments' pledges not to devalue the currency) had huge debts denominated in dollars. These debts skyrocketed in local currency units when the depreciations came. Firms heavily laden with debt have a hard time convincing banks to lend them more.

iii. Example 3: Mexican Peso. The 1994 experience looks a lot like the Asian experience: a large devaluation, followed by a shift in the trade balance from deficit to surplus and a fall in production.

(c) Incentives Exist To Create Markets to Reduce Currency Risk: Forward Rates, Forward Exchange Swaps, Futures, Options.

2. Assets and Asset Returns.


Japanese Yen Per US Dollar
400
350
300
250
200
150
100
50
0
1971
1971
1972
1973
1974
1975
1976
1976
1977
1978
1979
1980
1981
1981
1982
1983
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1997
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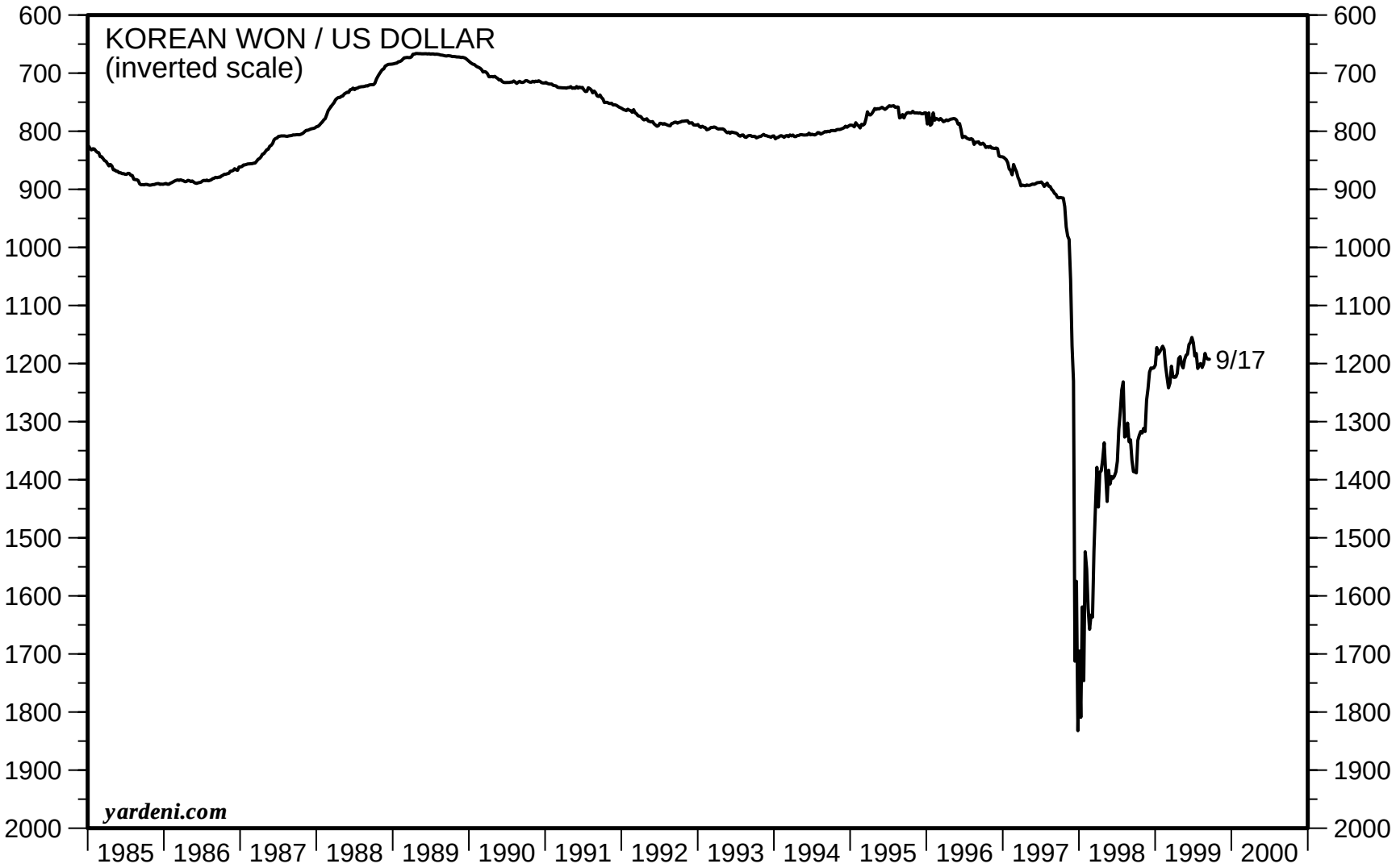
1999
Years


KOREAN WON / US DOLLAR
(inverted scale)
9/17
yardeni.com
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
1985
1986
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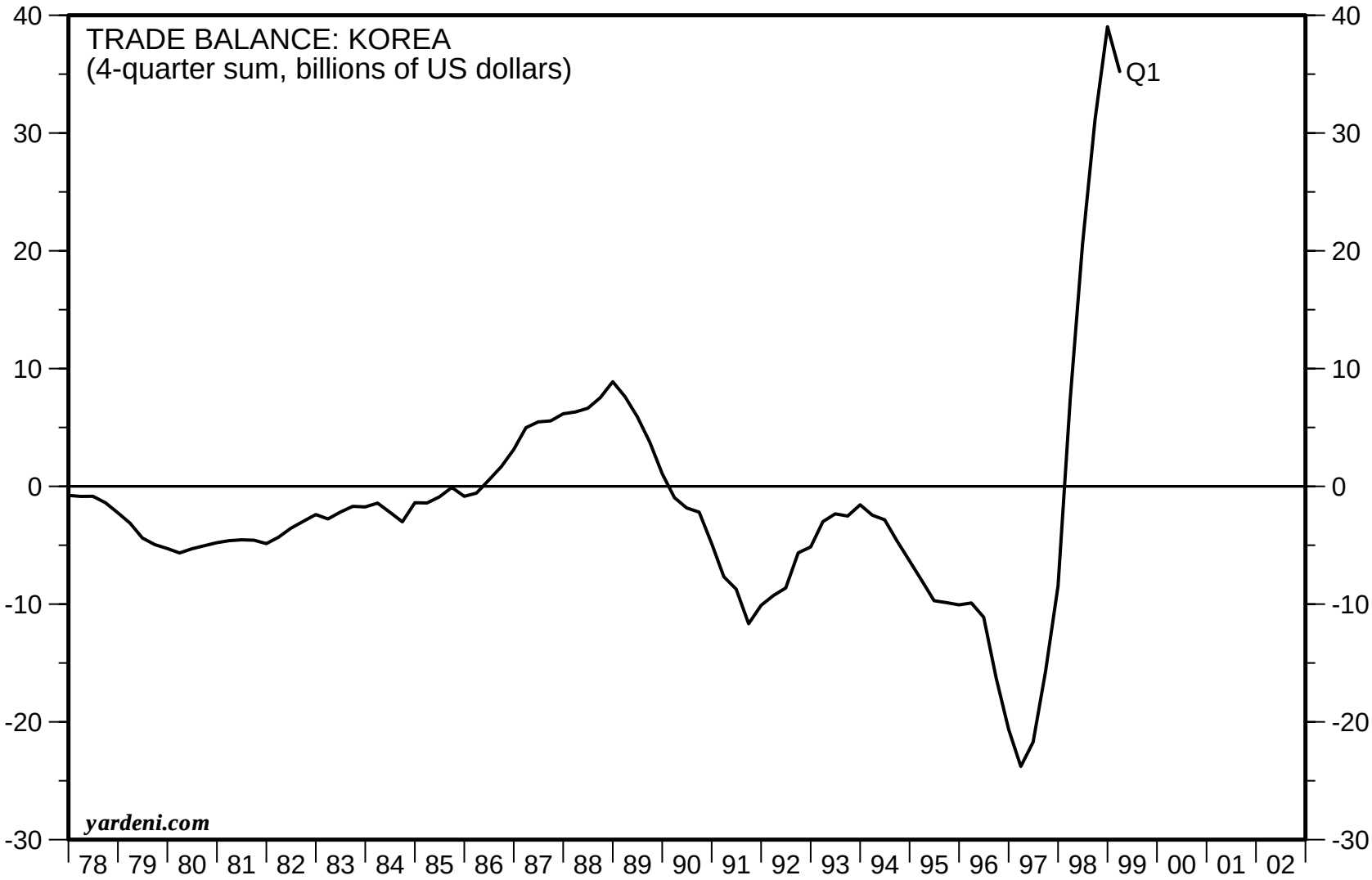
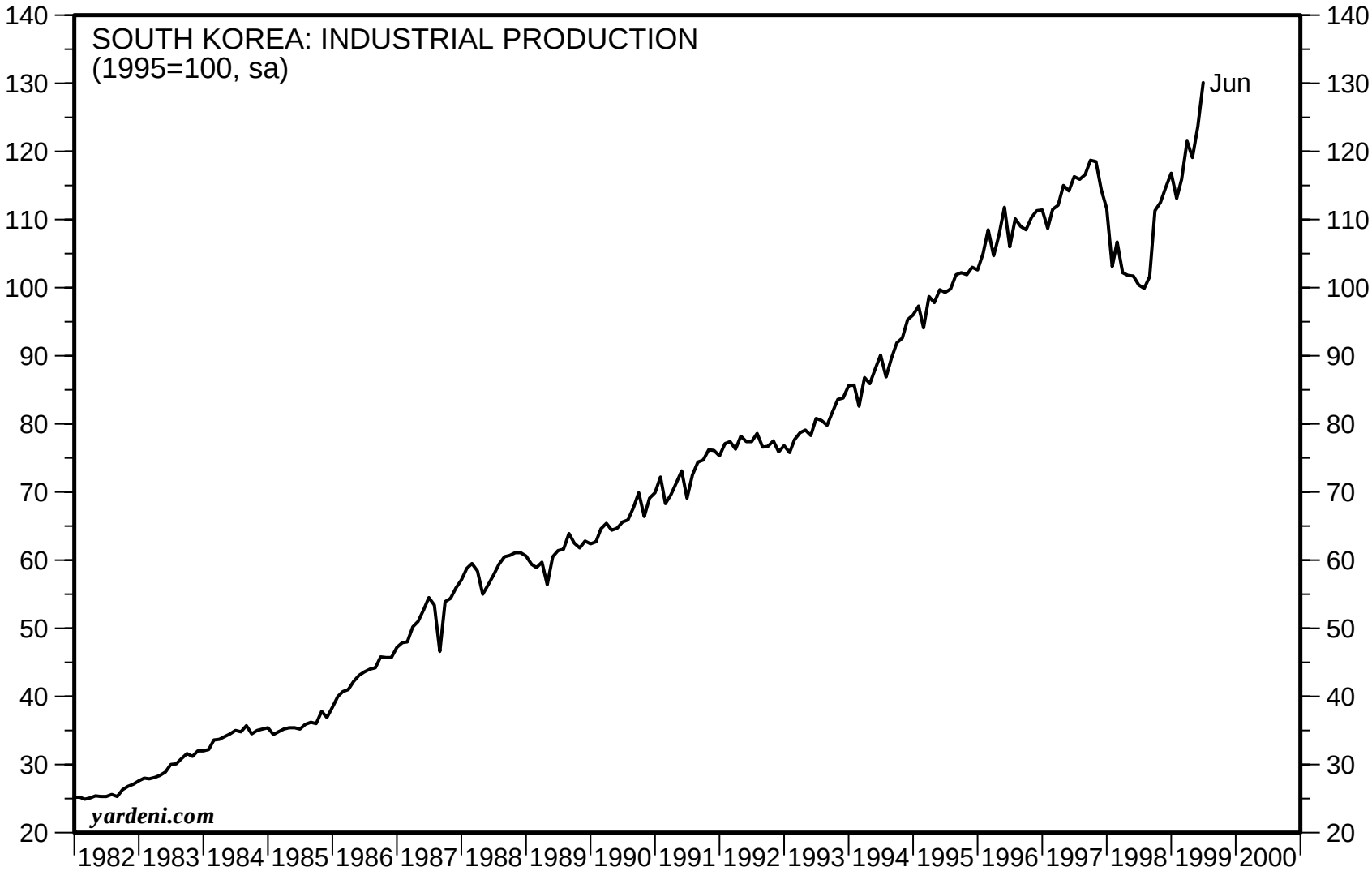
1999
2000



Source: IMF International Financial Statistics


SOUTH KOREA: INDUSTRIAL PRODUCTION
(1995=100, sa)
Jun
yardeni.com
140
130
120
110
100
90
80
70
60
50
40
30
20
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
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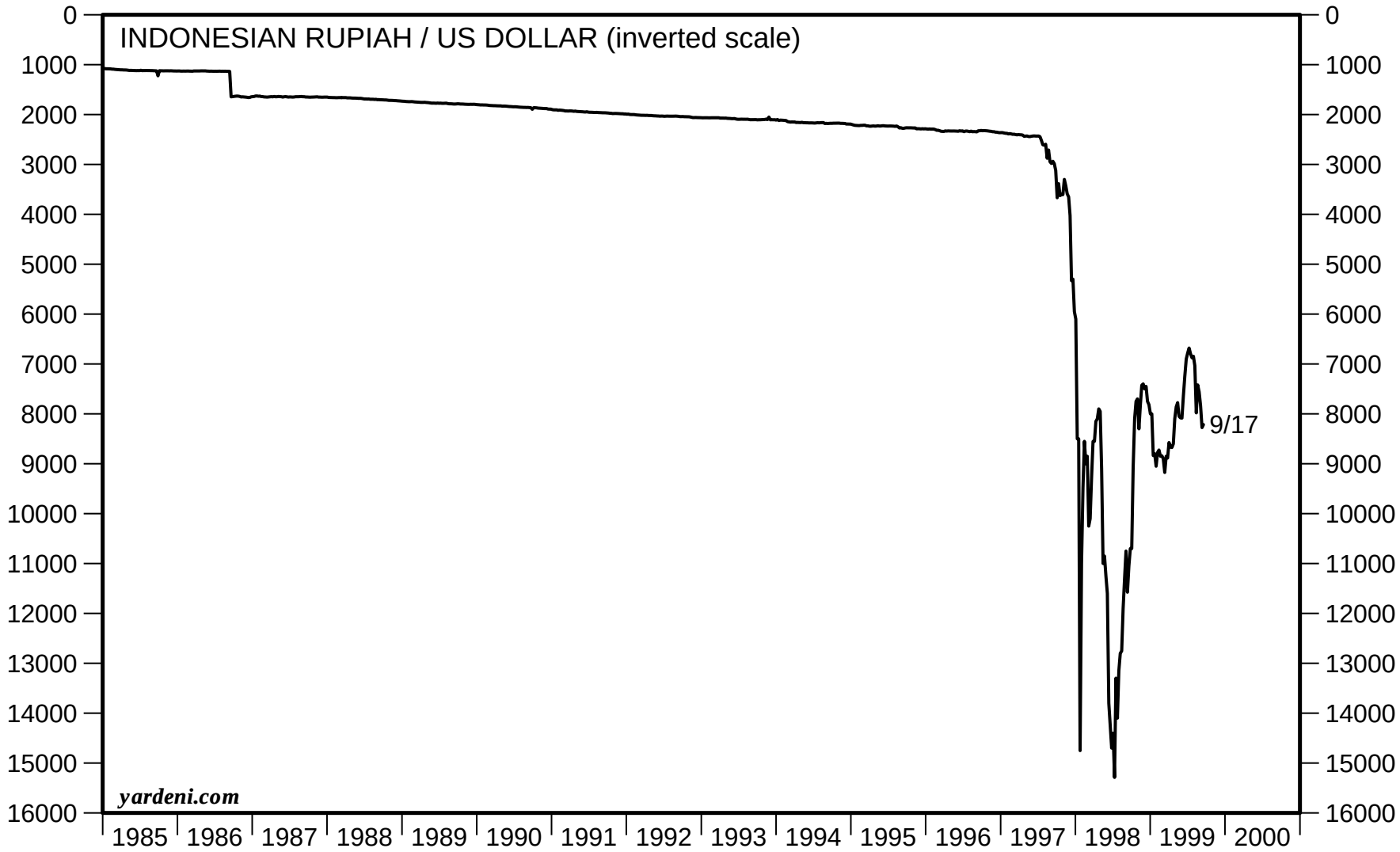
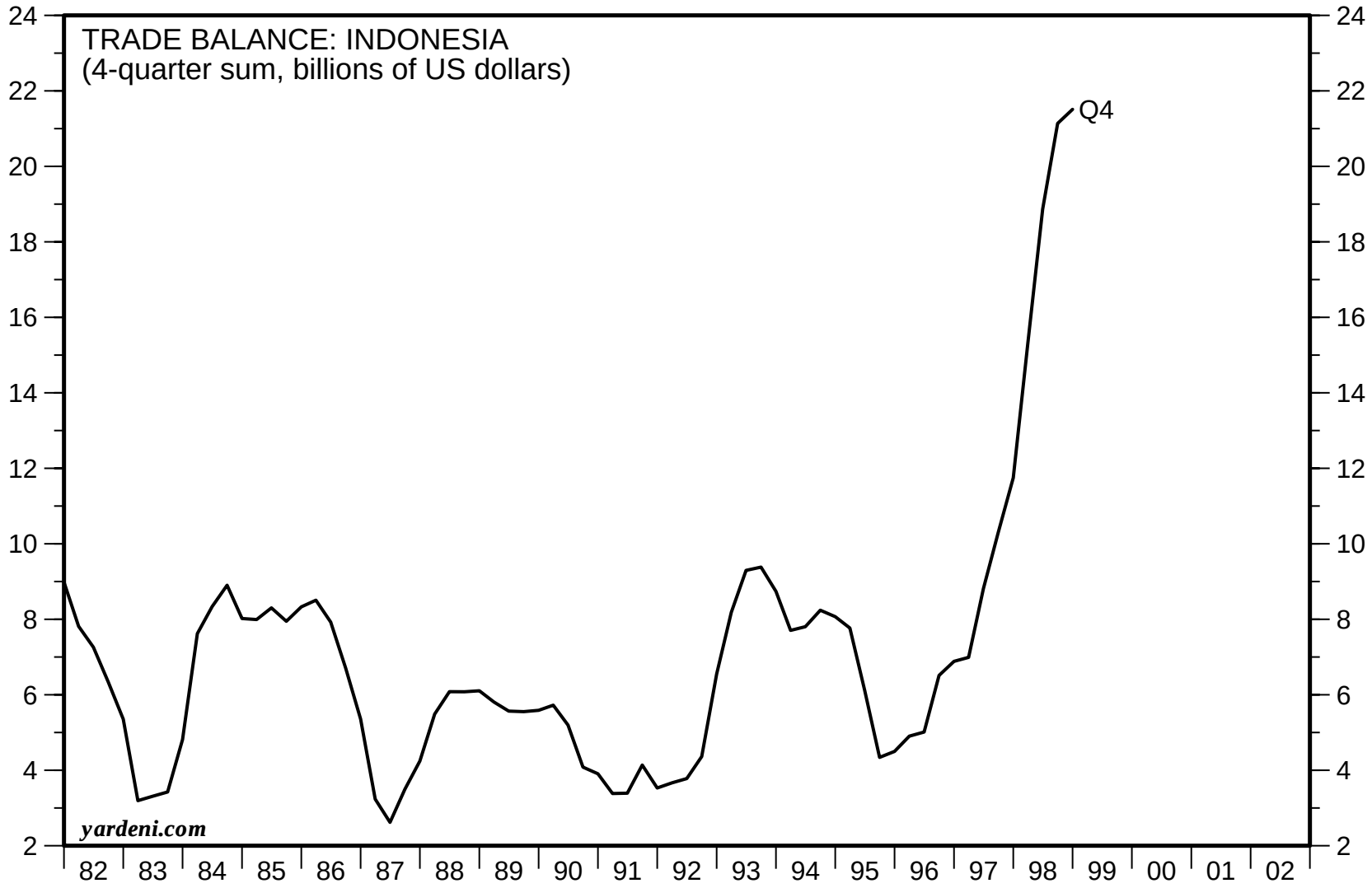
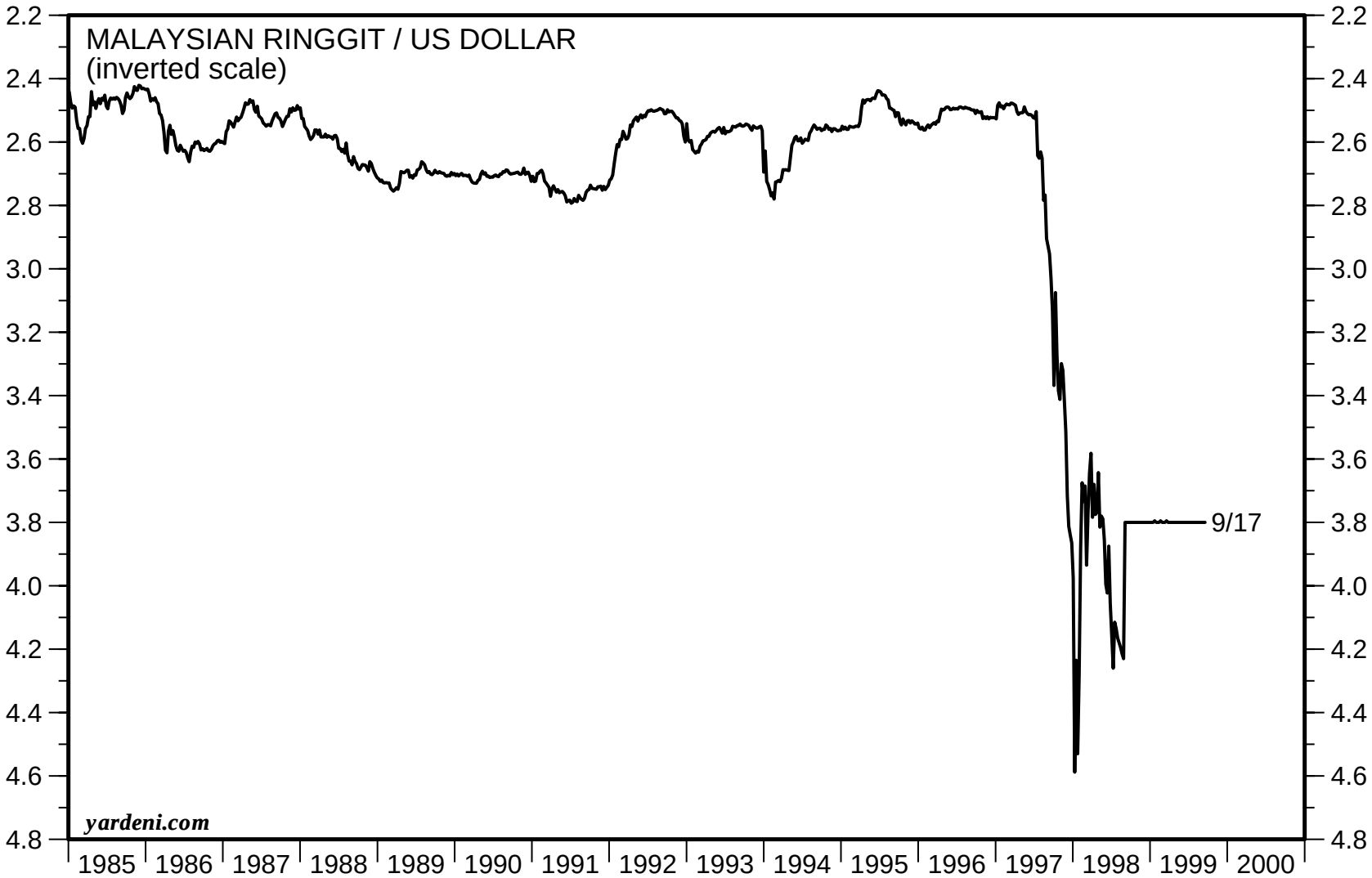
1996
1997
1998
1999
2000

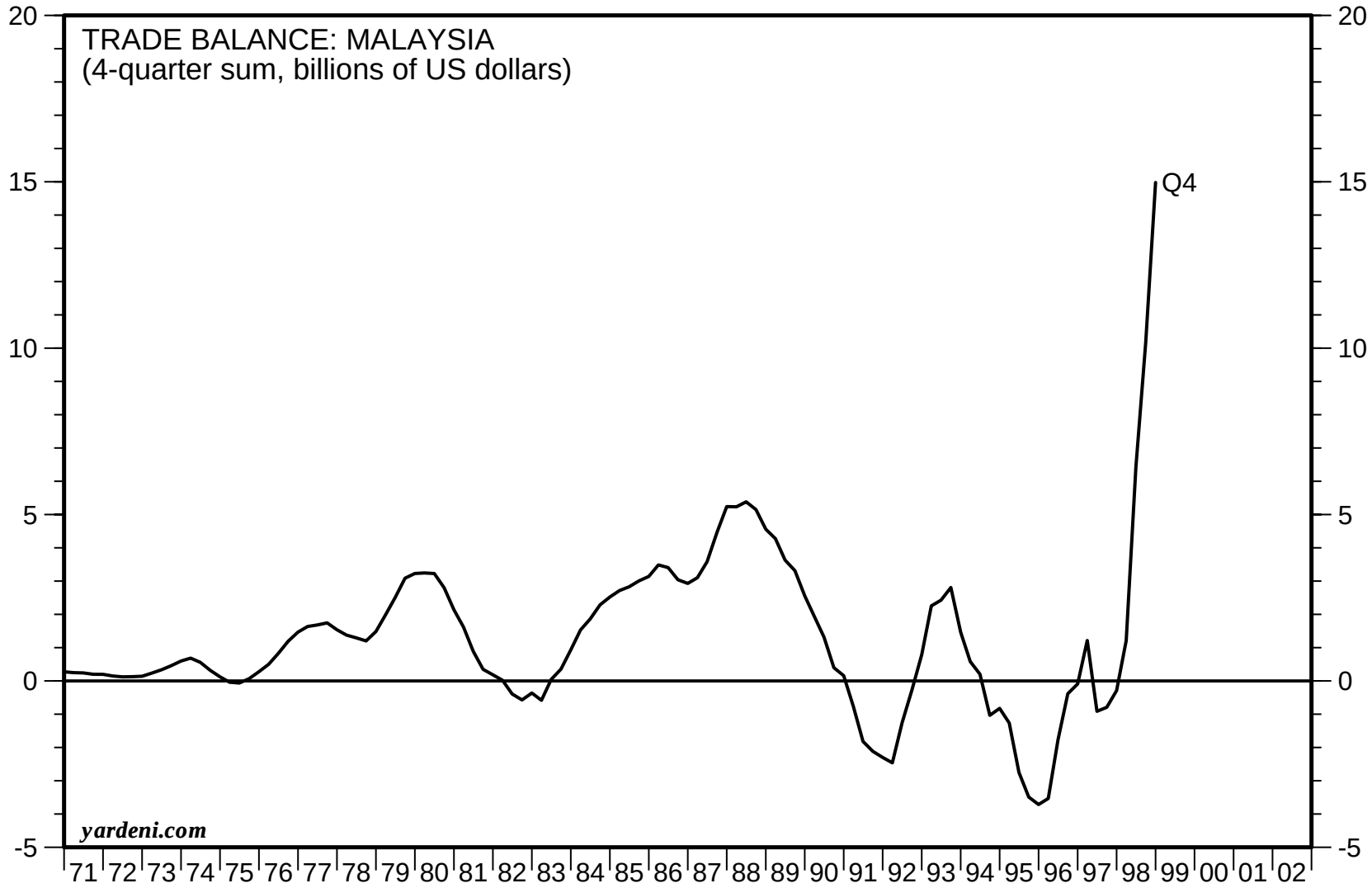

INDONESIAN RUPIAH / US DOLLAR (inverted scale)
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
12000
13000
14000
15000
16000
9/17
yardeni.com
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000



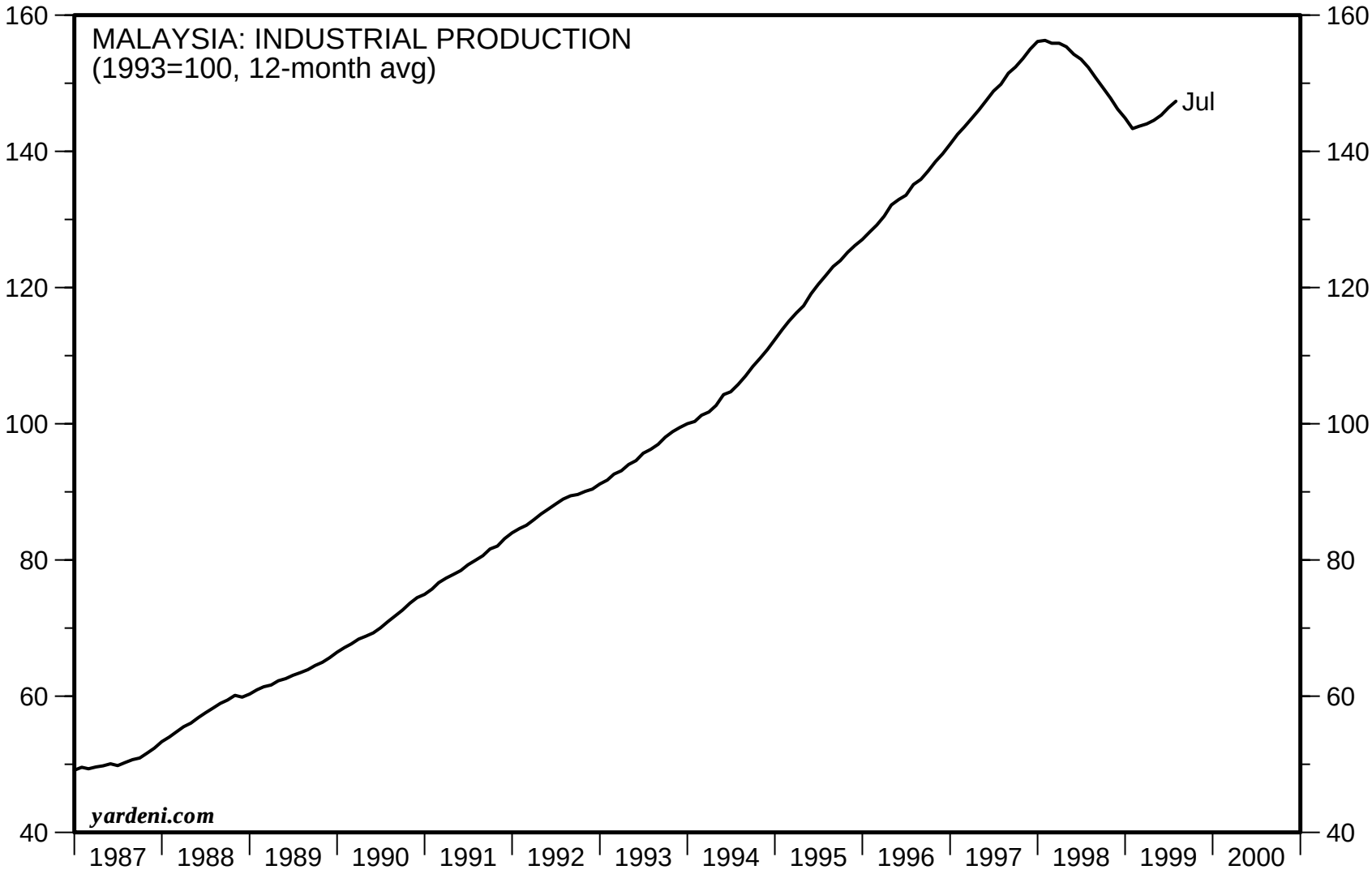
Source: IMF International Financial Statistics.

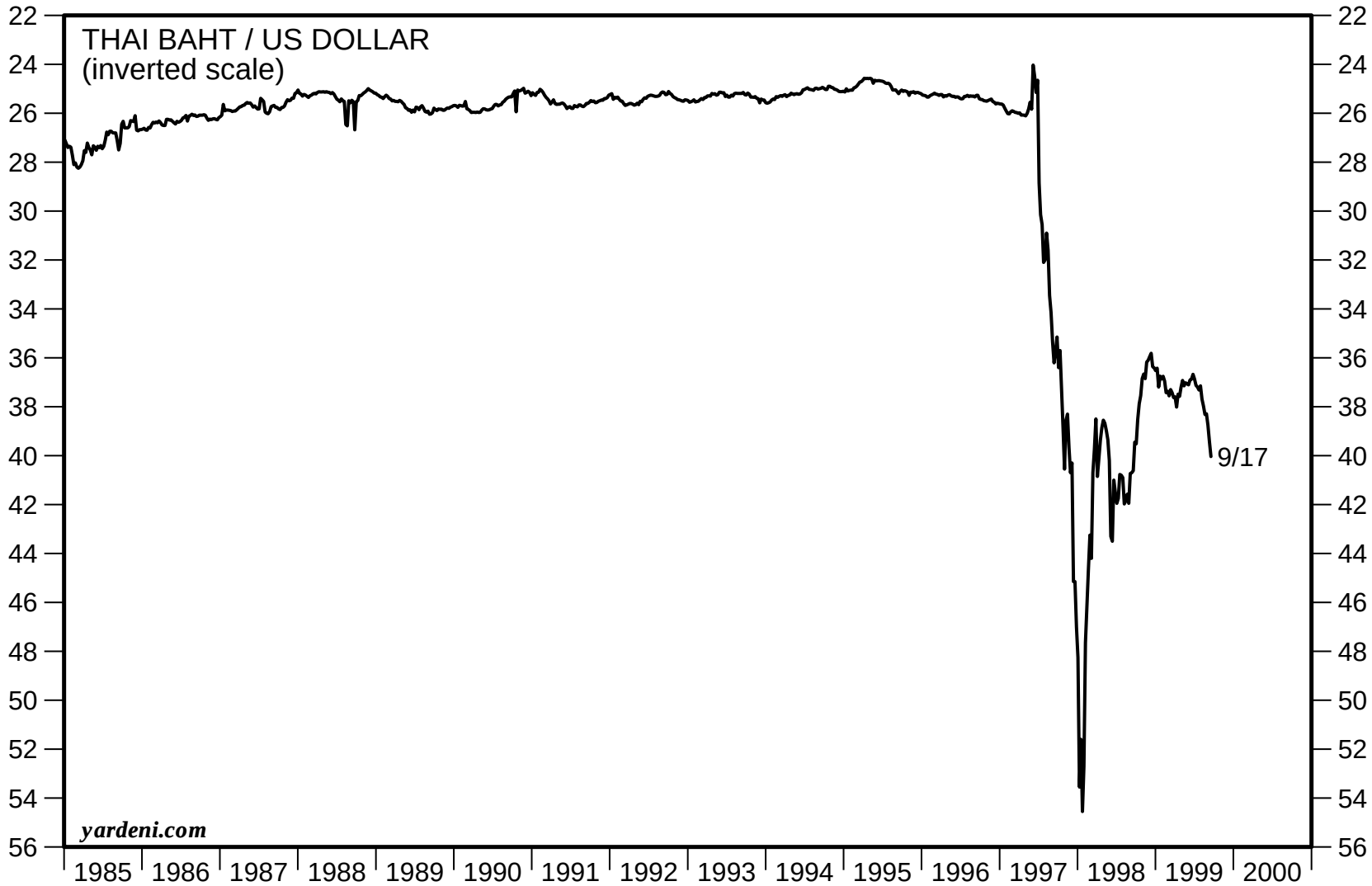

INDONESIA: INDUSTRIAL PRODUCTION
(1986=100, 4-quarter avg)
Q2
yardeni.com
160
140
120
100
80
60
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000


MALAYSIAN RINGGIT / US DOLLAR
(inverted scale)
2.2
2.4
2.6
2.8
3.0
3.2
3.4
3.6
3.8
4.0
4.2
4.4
4.6
4.8
9/17
yardeni.com
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000



* Source: IMF International Financial Statistics.


MALAYSIA: INDUSTRIAL PRODUCTION
(1993=100, 12-month avg)
Jul
yardeni.com
160
140
120
100
80
60
40
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000


THAI BAHT / US DOLLAR
(inverted scale)
9/17
yardeni.com
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
1985
1986
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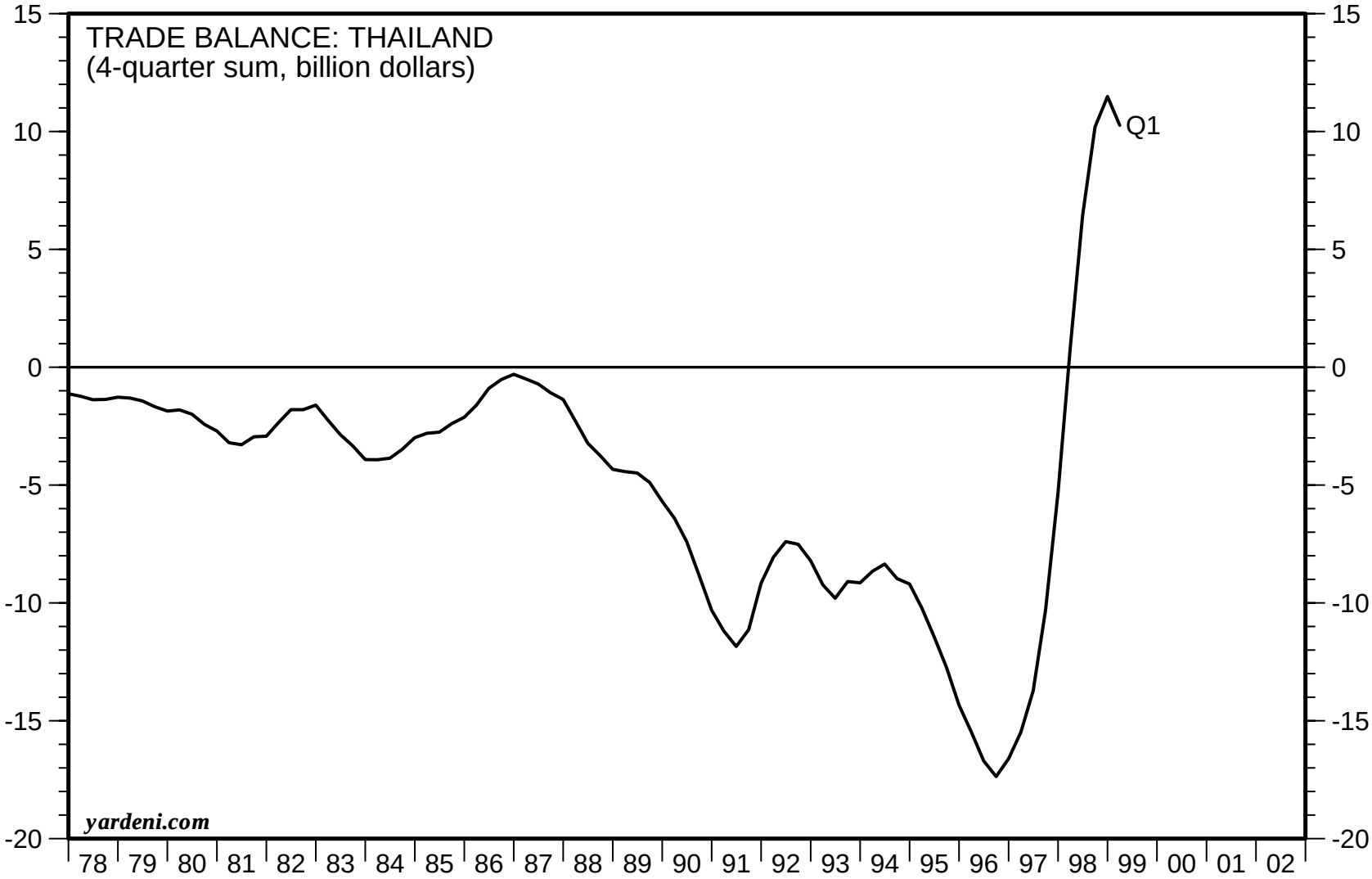
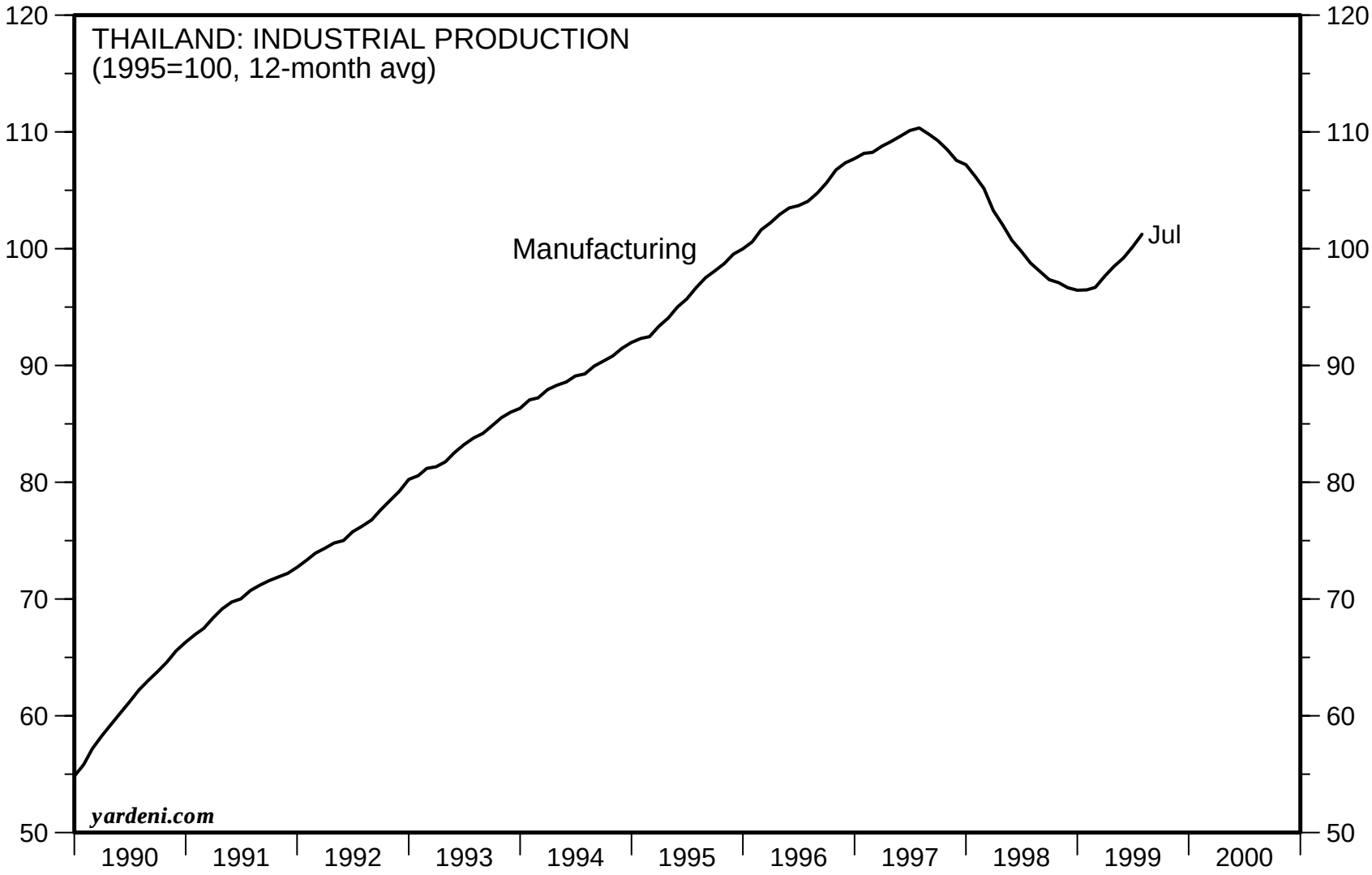
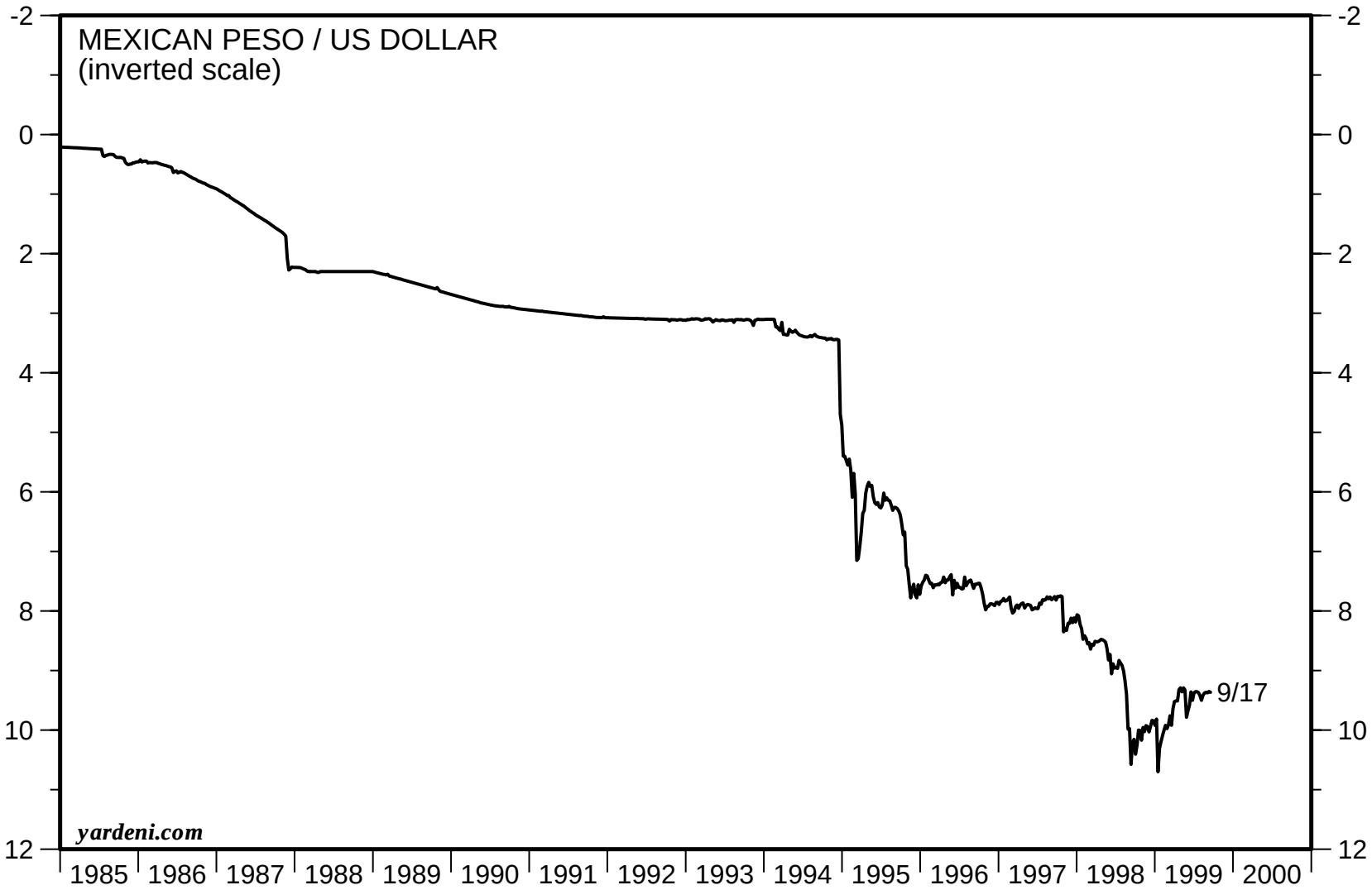
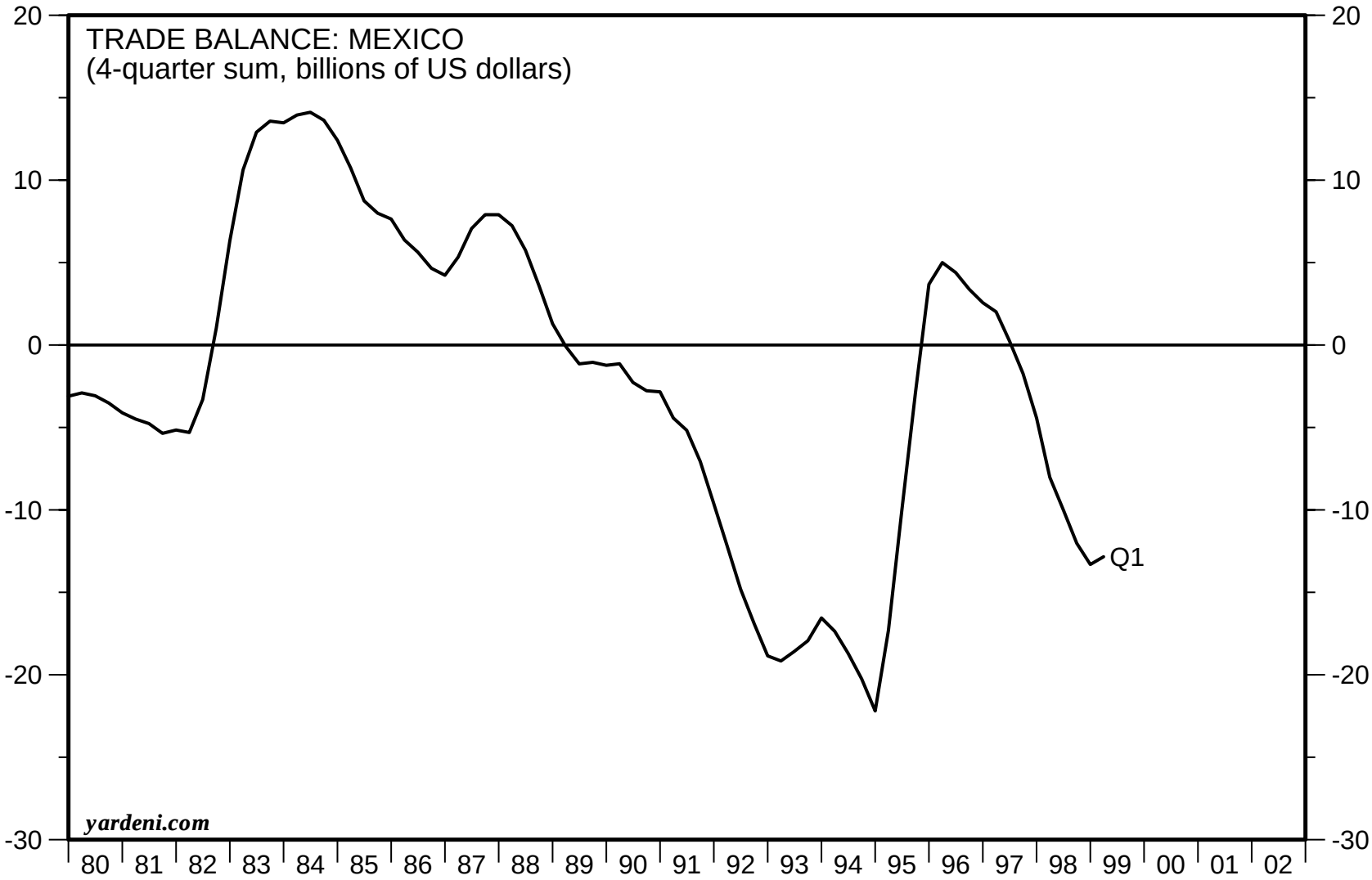
2000



Source: IMF International Financial Statistics.


THAILAND: INDUSTRIAL PRODUCTION
(1995=100, 12-month avg)
Manufacturing
Jul
yardeni.com
120
110
100
90
80
70
60
50
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000


MEXICAN PESO / US DOLLAR
(inverted scale)
-2
0
2
4
6
8
10
12
9/17
yardeni.com
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000



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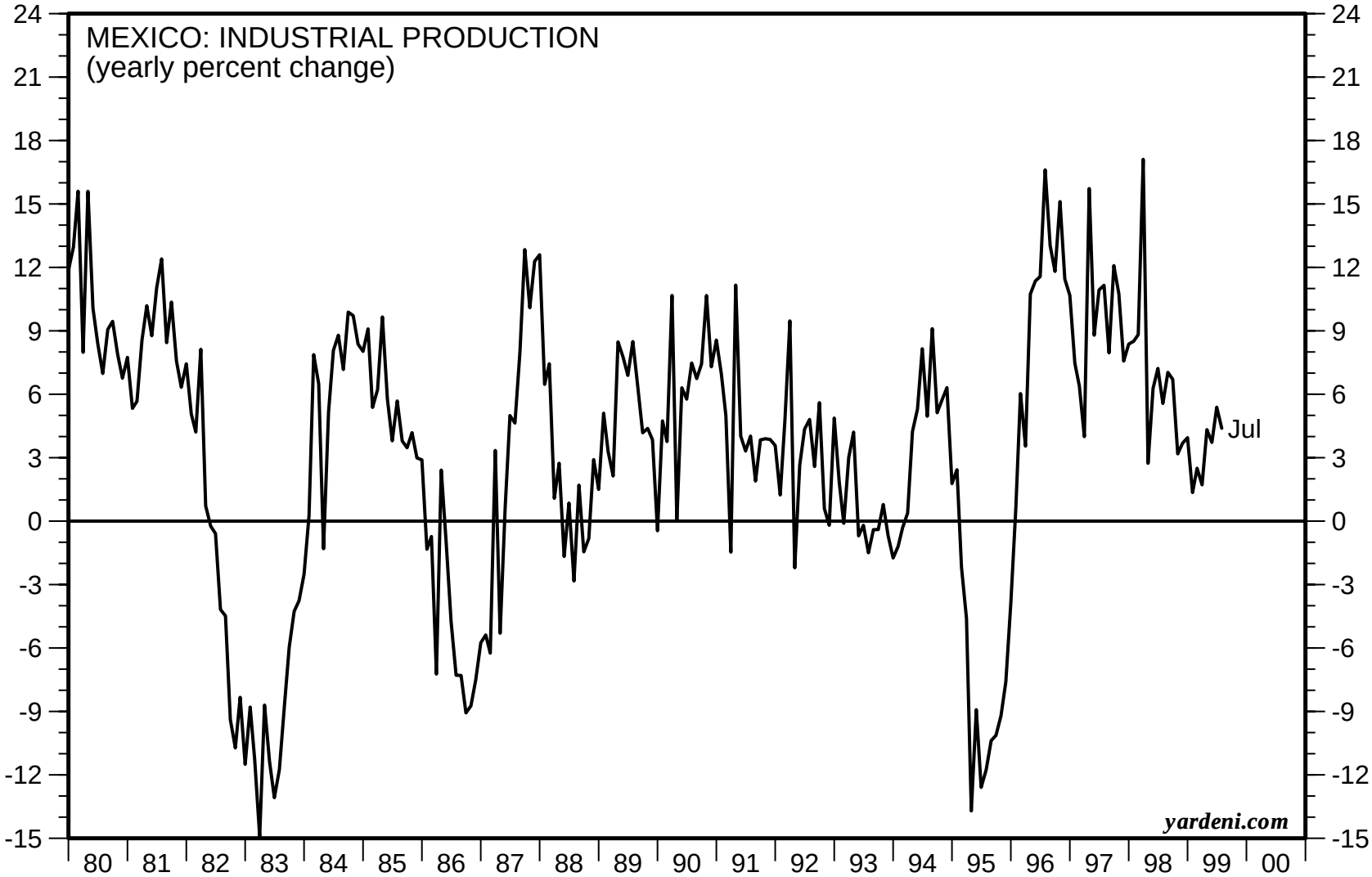
MEXICO: INDUSTRIAL PRODUCTION
(yearly percent change)
24
21
18
15
12
9
6
3
0
-3
-6
-9
-12
-15
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
00
Jul
yardeni.com