

Low Interest Rates and Bank Profitability – The International Experience So Far

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Photo: PM Images

Abstract

This article discusses the effect that low interest rates may have on bank profits, and reviews the experience of banks in economies that have had very low interest rates for an extended period. In the short to medium run, low or negative interest rates appear to reduce bank profits only a little, after accounting for the positive effects of lower interest rates on loan losses and demand for credit. However, the negative effects on bank profits increase when interest rates remain very low for a prolonged period. The profits of smaller banks – which have more household deposits, limited pricing power or less capacity to adjust their activities – are more sensitive to a prolonged period of low interest rates.

Short- and long-term interest rates have fallen to very low levels in many advanced economies, following decades of decline (Graph 1). Market pricing indicates that interest rates are expected to remain at low levels for at least several years. While low rates are appropriate to support economic activity during times of weak growth, they can also facilitate a build-up of risk in the financial system. One way low interest rates might increase risk is by weighing on bank profits, thereby lowering their resilience.

Why does bank profitability matter?

Profitable banks are an important part of a stable financial system. Profits are a buffer against which banks can write off loan losses and a source of funds for rebuilding capital should a bank incur large losses. They also allow banks to attract outside capital. However, it is important to consider bank profits on a risk-adjusted basis. Very high bank profitability can reflect very high risk-taking, which can threaten financial stability. High profits could also reflect a lack of competition.

Bank profitability can also influence the transmission of monetary policy by affecting banks' willingness or ability to extend credit. In principle, if very low interest rates reduce bank profits substantially, then the net benefits from easing monetary policy further could decrease. In the extreme, easing policy could be self-defeating if lower profitability reduced banks' willingness to supply new credit (Brunnermeier and Koby 2019; Eggertsson *et al* 2019). Similarly, a given reduction in policy interest rates may provide less stimulus when interest rates are already low if banks widen their lending spreads to protect their profitability (Brassil, Cheshire and Muscatello 2018).

How can low interest rates affect bank profitability?

As banks adjust to a low interest rate environment, there will be various effects on their profits. Some effects are positive, others negative and some are ambiguous. Additionally, the speed, magnitude and persistence of the effects can vary by bank, depending on the characteristics of their funding and lending, and the nature of their operations.

When asking what effect low interest rates have on bank profits it is important to consider what would happen to banks' profits if interest rates were unchanged in the face of a weakening economy. Bank profits generally depend on households and businesses having demand for credit and the ability to repay it with interest. If interest rates were kept high while the economy weakened, the capacity of households and businesses to borrow and repay

loans would be diminished and banks' profits would ultimately suffer. In this sense, lower interest rates support bank profits because they reduce the negative impact of weaker economic activity.

Net interest margin

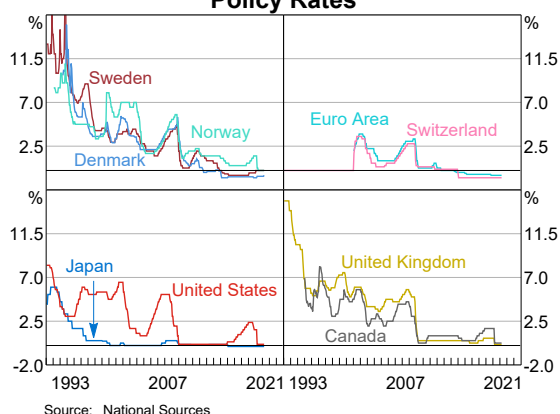
The core activity of most banks is lending, and they make money from this by lending at interest rates that are higher than what they pay for their funding. The net interest margin (NIM) (the ratio of net interest income to interest earning assets) is therefore a key indicator of bank profitability. If a decline in policy interest rates results in banks' funding costs declining by less than their lending rates, then NIMs will narrow and bank profits will decline (all else being equal). There are several reasons why this might happen.

The lower bound on deposit rates

As short-term interest rates become very low, a greater share of deposit rates may reach their effective lower bound. The effective lower bound is the limit on how low deposit rates can go. In principle, deposit rates can be negative, but negative rates give customers an incentive to withdraw their deposits from the banking system (e.g. by holding physical cash), and this causes a limit on how low negative deposit rates can go. The cost of moving money out of the banking system is larger for businesses and other large depositors (e.g. the cost of insuring large amounts of cash) so the lower bound on their deposits is further below zero than for household deposits. Rather than charge negative rates, banks can charge fees on deposit accounts, though this still gives customers an incentive to withdraw their deposits.

If lending rates continue to decline when deposit rates have reached their lower bound, then NIMs will narrow. The implications of the lower bound on deposit rates for banks' funding costs depends on the amount and composition of deposit funding. In aggregate, US banks source 80 per cent of their funding from deposits, most of which are from households (Graph 2). By contrast, UK and Swedish banks fund around 40 per cent of their assets with deposits, around half of which is from households. Banks in Denmark fund only around 20 per cent of

Graph 1
Policy Rates



their assets with deposits.^[1] Non-deposit sources of funding (such as bonds) have more scope to pay negative interest rates, so lower interest rates should have less effect on bank profits in countries with lower deposit shares of funding.

Asset yields

The effect of low rates on banks’ NIMs also depends on how banks adjust their lending rates. The degree and speed of adjustment in banks’ lending rates depends on their pricing power and the composition of their assets. Banks with more pricing power can ensure the decrease their lending rates is closer to the decrease in their funding costs, leaving their NIMs less affected. Similarly, banks with fixed-rate loans may experience a temporary widening of NIMs when interest rates decline, though in the long run, average lending rates will decline as new loans are written and older loans mature. Banks can also increase their lending rates by lending to riskier borrowers; although this may weigh on future profits if this behaviour leads to higher losses.

Banks’ holdings of (low-yielding) liquid assets may increase when interest rates decline, which further lowers their NIMs. In recent years central banks have increasingly used large-scale asset purchases as policy rates have fallen to very low levels. These asset purchases can leave banks with more liquid assets in the form of (low-yielding) deposits at their

central bank (Graph 3). The negative effects on asset yields can be mitigated by central bank actions. Some central banks have used ‘tiering’ of bank reserves, whereby a portion of banks’ reserves receive a higher interest rate.^[2] Additionally, availability of cheap funding from central banks, including through term lending facilities, also helps to mitigate pressure on banks’ NIMs when interest rates are low.

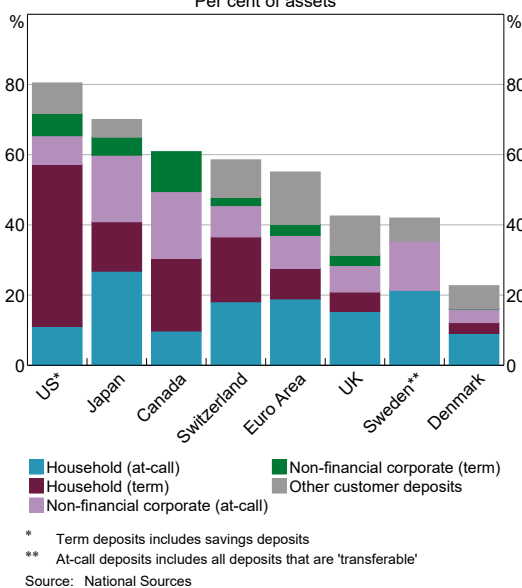
Flattening yield curves

A flatter yield curve can also narrow banks’ NIMs. Yield curves do not necessarily flatten when interest rates decline, but can do so, especially when interest rates approach very low levels (Graph 4). This partly reflects that central banks have sought to lower longer-term rates as short-term rates have approached their lower bound. Banks typically borrow short term (e.g. deposits) and lend long term (e.g. mortgages). As such, when yield curves flatten (and the difference between long- and short-term rates declines), banks’ NIMs narrow. The narrowing may be delayed for banks whose assets reprice slower than their liabilities.

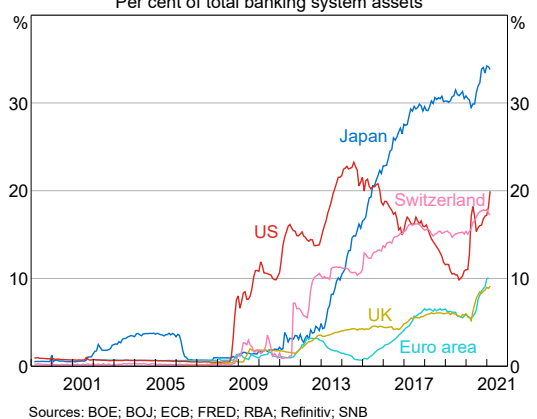
Zero-interest equity funding

A portion of banks’ funding is from equity, which bears no interest regardless of the level of interest rates. This limits the extent to which changes in interest rates flows through to bank funding costs and causes NIMs to change with interest rates.^[3] Common equity accounts for about 10 per cent of global systemically important banks’ funding. As a

Graph 2
Bank Deposit Funding
Per cent of assets



Graph 3
Reserves Held at the Central Bank
Per cent of total banking system assets



simplified example, if interest rates on all of a bank’s assets and non-equity liabilities fell by 100 basis points, and 10 per cent of funding is from equity, then the NIM would narrow by 10 basis points.

Positive effects of low interest rates on bank profits

Lower interest rates can also increase bank profits in several ways. Lower interest rates support economic growth and reduce interest burdens for indebted households and businesses. Since lower rates contribute to a stronger economy and more resilient households and businesses, they lower banks’ impairment expenses both because borrowers are better placed to service their debt and because prices of assets that banks have as collateral should be higher. Lower interest rates also increase demand for credit which supports bank profits. Stronger credit growth and refinancing activity (which typically increases when interest rates fall) also increases banks’ fee income. Indeed, Brei, Borio and Gambacorta (2019) find that ‘low interest rates induce banks to rebalance their activities from interest-generating to fee-generating and trading activities’. Finally, banks will book capital gains on their holding of financial assets when interest rates decline, though this should be a one-time boost to profits.

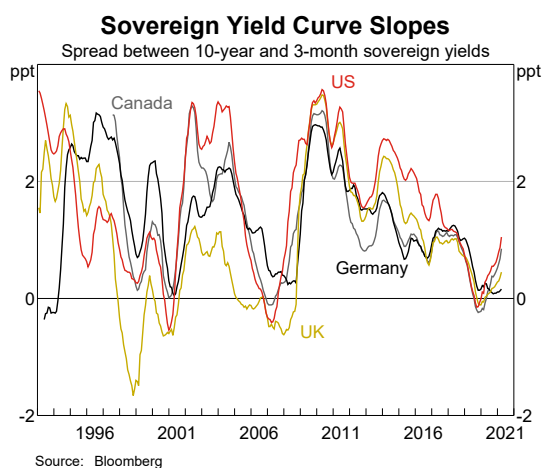
Bank profitability in economies with very low interest rates

Since the global financial crisis (GFC), some countries have adopted negative policy rates, some

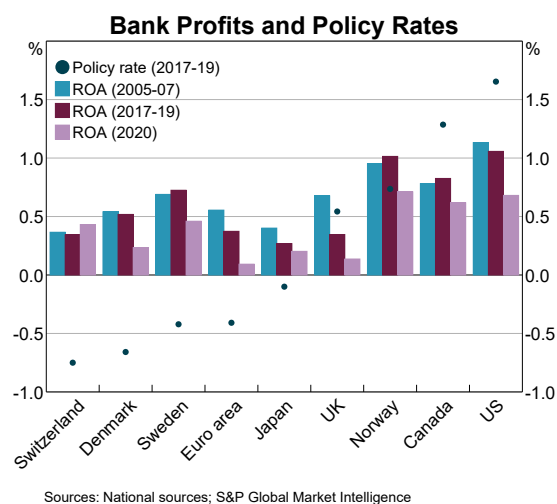
have maintained positive but low policy rates and others have maintained rates well above zero. Overall, there is no obvious relationship between change in profitability (measured by the return on assets (ROA)) and interest rates across a sample of advanced economies. Comparing the blue and purple bars in Graph 5, bank profits have decreased in some economies that implemented negative policy rates since the GFC, such as Japan and the euro area. But in others, such as Sweden, Switzerland and Denmark, bank profits have been maintained. Economies that have maintained positive interest rates, such as the United States, Canada and Norway have generally not seen a deterioration in bank profits since the GFC.

Even focusing more narrowly on NIMs, the component of profits that is most directly related to interest rates, there is no clear relationship. In some countries that adopted negative policy rates, such as Japan and Denmark, NIMs narrowed (Graph 6). In Japan’s case, this is because deposit rates have been around zero since the early 2000s, while lending rates declined owing to competition between lenders. However, in other jurisdictions that adopted negative rates, such as the euro area, Switzerland and Sweden, the story is less clear. In Switzerland and Sweden, NIMs increased after the GFC until about 2015 as deposit rates declined faster than lending rates. Banks also increased higher-risk (and higher-yielding) residential and commercial property lending over this period. Since 2015, NIMs have declined a little as interest rates fell

Graph 4



Graph 5



further below zero and banks were reluctant to pass these declines through to deposit rates. In the euro area, NIMs were broadly flat up until 2019. This reflects that euro area banks were able to match a decline in their lending rates with lower deposit rates, including by introducing negative deposit rates in some cases (see ‘Negative deposit rates’ section below).

In 2020, NIMs declined sharply for most advanced economy banks. This reflects a combination of factors, including greater holdings of low-yielding assets such as central bank reserves (see Graph 3), and a sharp flattening of yield curves (See Graph 4).

In countries that maintained positive but low policy rates, NIMs have generally been little changed since the GFC. However, as interest rates declined sharply in 2020, NIMs also declined, especially in the United States.

Negative deposit rates

European banks have increasingly charged negative interest rates on their deposits over the past couple of years. According to the European Central Bank (ECB), 7 per cent of at-call retail banking deposits in the euro area were subject to negative interest rates as of November 2020 (ECB 2020).^[4] The share of euro area retail term deposits with negative interest remained negligible, but banks have benefited from a continued shift of deposits into at-call accounts (Graph 7). In Denmark, the average outstanding interest rate on household term deposits reached –15 basis points in January 2021.

Using confidential data, Altavilla *et al* (2019) report that in the euro area one-quarter of non-financial corporate deposits had a negative deposit rate as of late 2019. However, most accounts incurred only small negative interest rates at the time. More timely, though less detailed, public data indicate that average rates on new corporate term deposits declined to –30 to –40 basis points or lower in some euro area economies in late 2020, including Belgium, Germany, the Netherlands and Spain. New interest rates on corporate deposits in Switzerland and Denmark have recently reached –40 and –50 basis points.

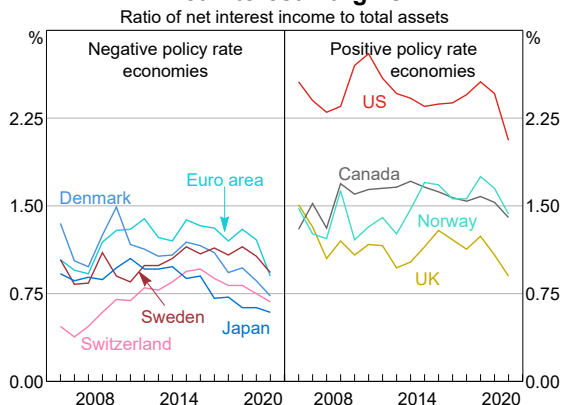
Smaller banks

The discussion so far has focused on aggregate profitability, which is dominated by large banks. Comparing aggregate with median outcomes indicates the extent to which the aggregates have been driven by factors specific to large banks. For example, smaller banks tend to use more deposit funding, and their NIMs might compress more when interest rates decline because of the effective lower bound on deposit rates.

The median change in ROA was larger (more negative) than the change in the aggregate for several economies that adopted negative interest rates, indicating that smaller banks have seen a larger decline in profits. In particular, prior to COVID-19, the median ROA in the euro area, Japan, Denmark and Switzerland had contracted by roughly 25–30 basis points relative to the GFC, compared to smaller contractions in the weighted-

Graph 6

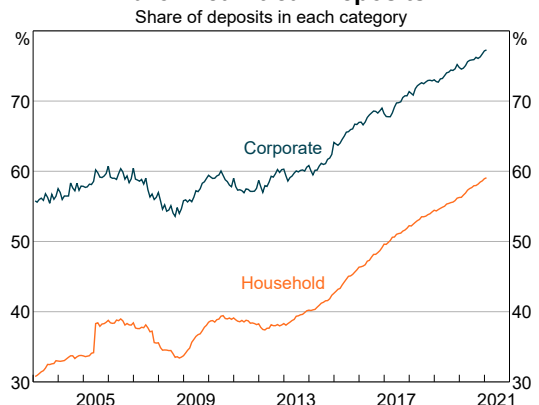
Net Interest Margins



Sources: RBA; S&P Global Market Intelligence

Graph 7

Euro Area At-call Deposits



Source: ECB

average ROA (Graph 8). However, Sweden had the opposite outcome. The evolution of smaller banks’ profitability was more similar to that of large banks in positive policy rate economies.

The under-performance of smaller banks in negative interest rate economies partly reflects that their NIMs have declined relative to larger banks (Graph 9). The sharper fall in smaller banks’ NIMs following the GFC mostly occurred after policy interest rates first turned negative in 2014. Smaller banks use more household deposit funding. They also tend to have lower pricing power for lending compared with large banks, and so have not been able to raise lending margins to offset pressure on their NIMs.

Smaller banks have attempted to offset the narrowing in their NIMs by cutting operating costs and/or increasing fee income. For example, smaller Danish banks have increased their fee and commission income from 1 per cent to 2 per cent of assets, on average.

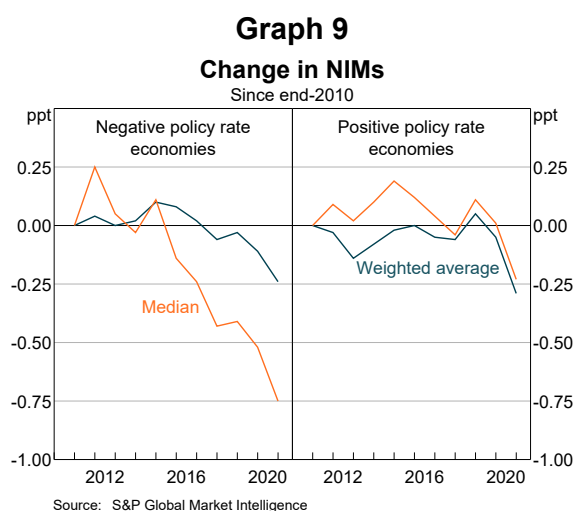
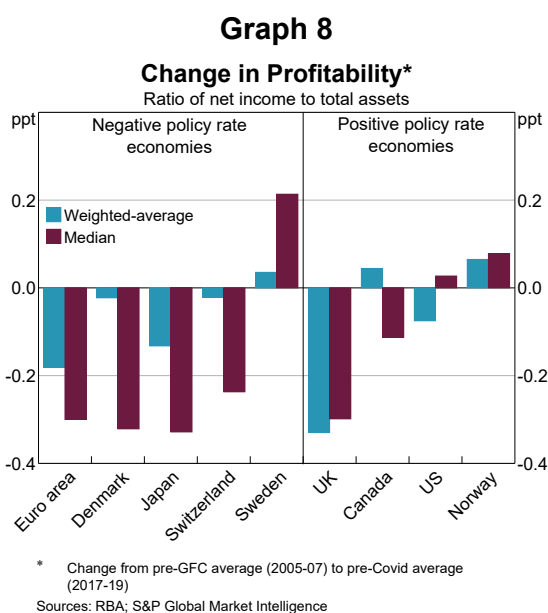
What are the estimates of the causal effects of low interest rates on banks’ profitability?

Over the past decade, a growing range of single- and cross-jurisdiction studies have attempted to estimate the causal effect of interest rates on bank profitability, holding other factors constant. Causal effects are commonly estimated with panel regressions, tracking data on multiple banks

through time. In these regressions, bank profitability is regressed against the short-term interest rate and yield curve slope. Other variables are also included to control for both individual bank characteristics and macroeconomic conditions that influence bank profitability.

Despite the commonality in the approach, there are a range of findings in the literature. Several papers find modest effects of lower interest rates on bank profitability. For example, Alessandri and Nelson (2015) find that for UK banks, a 100 basis point fall in interest rates is associated with a 4 basis points contraction in ROA after one quarter. Busch and Memmel (2015) find that a 100 basis point fall in the level of interest rates is associated with a 7 basis point contraction in the NIMs of German banks. However, Borio and Gambacorta (2017) find large effects of interest rates on the profitability of large advanced economy banks. They estimate that a 100 basis point fall in interest rates is associated with a 25 basis point fall in banks’ ROA after one year, with this effect increasing up to 40 basis points when interest rates are very low. The profitability of smaller, less diversified and more deposit-funded banks is more negatively affected by low interest rates (Lopez, Rose, and Spiegel 2018 and Deutsche Bundesbank 2017).

In contrast, other papers find a negligible effect of interest rates changes on bank profitability. For example, Genay and Podjasek (2014) and Bikker and Vervliet (2017) both find that lower interest rates have a negligible effect on US banks’ profitability,



mainly because higher fees and lower loss provisions offset downward pressure on NIMs.

A prolonged period of low rates is found by several studies to have a larger negative effect on bank profits. For example, Claessens, Coleman, and Donnelly (2018) find that ROA is 25–30 basis points lower after being in a low interest rate environment for 4 years. Similar results are found in ECB (2020). These results emerge because the negative effect of low interest rates on NIMs is very persistent, and is estimated to outweigh the positive effects on other components on bank profits (some of which are temporary) (Brei *et al* 2019).

Altavilla, Boucinha and Peydró (2018) argue that many studies in this area could be biased because they don't fully account for the common effect of GDP on bank profits and interest rates. They include macroeconomic forecasts as additional controls and find no robust association between interest rate changes and euro area banks' profitability in the short run. A similar result was found by Stráský and Hwang (2019). Altavilla *et al* (2018) do find that profitability is lower during prolonged periods of low interest rates, but the estimated effect is small – about 2½ basis points for each additional year in a low interest rate environment. The authors also argue that this effect is likely outweighed by the positive effects of lower interest rates on the macroeconomy.

In recent years more studies have focused specifically on the effect of negative rates on bank profitability. Turk (2016) and Basten and Mike (2018) find that banks' profitability has been resilient following the introduction of negative interest rates, at least in the short- to medium-term. Rostagno *et al* (2019) also estimate that euro area bank profitability would have been lower in counterfactual scenarios in which the policy interest rate was non-negative. By contrast, Beauregard and Spiegel (2020), Urbschat (2018) and Eggertsson (2019) find that negative interest rates negatively affect banks'

profitability in the longer run, partly because of banks' limited ability to pass along negative rates to depositors or otherwise adjust their business models. These papers are consistent with studies that find that the introduction of negative interest rates has negatively affected bank share prices, which contain within them expectations of long-run bank profitability (Ampudia and van den Heuvel 2019; Bats, Giuliodor and Houben 2020; Hong and Kandrac 2018).

Overall, the available evidence indicates that lower interest rates typically have a negligible to modest negative effect on bank profitability in the short run. This is at least partly because of the positive effect that lower interest rates have on economic growth and banks' asset quality, which offsets the negative effects of lower interest rates on NIMs. However, there is evidence that bank profitability falls further when interest rates are at low levels and remain low for a prolonged period. Smaller banks' profitability is also more sensitive to lower interest rates, both in the short and longer run.

Conclusion

International experience since the GFC has not borne out a clear relationship between interest rates and bank profits across jurisdictions. Some economies that have adopted negative interest rates have seen their banks maintain profits, while others have seen profits decline. The growing literature on the topic provides some common conclusions. In the short run, most studies find at most a modest negative effect of lower interest rates on bank profits in aggregate, but larger effects for smaller banks. However, some authors (such as Altavilla *et al* 2018) have raised concerns about the approaches taken in these studies and argue that the effects are negligible, particularly in the short term. There is stronger evidence that bank profits decline in prolonged low interest rate environments. ✖

Footnotes

- [*] The authors are from Financial Stability Department and would like to thank Eva Liu, Troy Gill for work on an earlier version of this article as well as Eden Hatzvi.
- [1] Denmark's low share of deposit funding reflects that about half of the banking system's assets are with mortgage banks, which have no deposits but receive funding from households indirectly through Danish pension funds.
- [2] Advanced economies that have implemented tiered reserve remuneration systems include Japan, Norway, Switzerland, Denmark and the euro area.
- [3] Although equity funding does not bear interest, banks need to deliver returns to equity holders to prevent their share prices from declining. The level of returns to shareholders needed to maintain share price is known as the 'cost of equity'.
- [4] See ECB (European Central Bank) (2020) 'Financial Stability Report'. Available at <https://www.ecb.europa.eu/pub/financial-stability/fsr/special/html/ecb.fsrart202011_02~c984477181.en.html#toc4>.

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