Switzerland, for decades a paragon of safety in finance, is engaged in a high-risk strategy to protect its export-driven economy, literally betting the bank in a fight to contain the prices of Swiss products sold abroad.

The nation's central bank is printing and selling as many Swiss francs as needed to keep its currency from climbing against the euro, wagering an amount approaching Switzerland's total national output, and, in the process, turning from button-down conservative to the globe's biggest risk-taker.

Switzerland's virtue is the root of its problem: broad confidence in the Swiss currency and economy has investors hungry for francs to escape euros, the currency of its shaky European neighbors. Such demand makes francs more expensive and, in turn, drives up the price of Swiss exports.

In the past three years, the Swiss National Bank SNBN.EB -0.20% has printed francs to buy euros and other currencies in a swelling portfolio of foreign assets four times what it was at the beginning of 2010.

Nearly every major central bank is buying nontraditional assets to resurrect domestic economies in the wake of the worst global recession in 75 years. The U.S. Federal Reserve is buying mortgages; the European Central Bank is making unusually long loans to banks; and the Bank of Japan is buying real-estate investment funds.

All risk losing money, but Switzerland's exposure stands out in character and scale: Its central bank is buying assets from other countries and its holdings of currencies, bonds, stocks and gold—nearly 500 billion Swiss francs, about $541 billion—are nearly the size of the nation's gross domestic product. In contrast, the Fed's buying of bonds and mortgages amounts to about 20% of U.S. national output, and the European Central Bank's holdings stand at 30% of total GDP.

In September 2011, the SNB set a goal of keeping its currency from rising beyond 1.20 francs to the euro, a threshold that SNB Chairman Thomas Jordan has said the bank would fight to maintain "with the utmost determination."

The strategy, so far, is working. The franc hasn't crossed the 1.20 threshold in 16 months. The Swiss economy is growing, albeit slowly, while the euro-zone economy is contracting. Inflation is nonexistent, though rising real-estate prices are prompting worry. Exports are up despite the euro-zone recession.

But the Swiss central bank is highly vulnerable to swings in exchange rates because of the SNB's vast holdings of euros and other foreign currencies. The Fed, by contrast, prints dollars and buys dollar-denominated assets, leaving it immune to such risk. The SNB can't do that because there aren't enough Swiss government bonds or other franc-denominated assets to buy.

With every upward move in the value of the euro, the Swiss central bank makes money. But every downward move triggers a loss. If the euro rose to 1.30, the SNB would make a profit. But if the euro falls by 10%—either because of a deterioration in the euro-zone sovereign debt or a banking crisis—much of the central bank's capital could be wiped out.

"The SNB is acting very much like a leveraged hedge fund," Bruce Krasting, a former currency trader, wrote on his blog. "It's making currency 'bets' with the people's money. It's taking some very big risks."

Switzerland's central banker acknowledged the risks but said there was no alternative. "It's not excluded that we could suffer a loss, but the risk of doing nothing was greater," Mr. Jordan, the Swiss central banker, said in an interview. "The franc was so strong that we could have fallen into a deflationary spiral."

Similar logic could prompt other countries to try to push down the value of their own currencies to boost exports, raising the prospect of a currency war. Japan's newly elected prime minister has promised a similar tactic. And Mervyn King, the governor of the Bank of England, warned recently that other countries may follow. "The politics pursued by countries for domestic purchases are leading to tension collectively," he said.

Even in Switzerland, the SNB has its doubters. "Our bank has taken the biggest risk of all because others have gone for government bonds in their own currencies, our bank goes for foreign [assets]," said Hans Kaufmann, economic spokesman of the conservative Swiss People's Party.
By printing so many francs, argue opponents, the SNB could be sowing seeds of future inflation. For now, that seems a remote possibility with Switzerland experiencing falling wages and prices, a deflationary period the central bank predicted would carry forward this year.

By hitching its policies to Europe's currency and economy, the SNB also could stir political opposition that threatens its independence. "De facto, now Switzerland is part of the euro area, which they always said would be damaging," said Charles Wyplosz, professor of economics at the Graduate Institute in Geneva.

The Swiss central bank strategy springs from the financial crisis four years ago. To nurse sick economies, the world's largest central banks first pushed short-term interest rates to historic lows. While averting disaster, the tepid recoveries have since led central banks to more aggressive moves, buying assets or making loans—risks now seen as a global macroeconomic experiment.

The Fed, for example, holds more than $800 billion in mortgage-linked securities. The ECB has made three-year loans to banks and conditionally offered to buy more bonds from cash-strapped euro-zone governments. The Bank of Japan has purchased corporate bonds, equities and shares of real-estate investment trusts.

"Taboos have fallen forever," said Mr. Wyplosz. Central bankers, he said, "have discovered that the word 'unlimited' is the only remaining tool they have."

Given its golden reputation, the franc became a magnet for investors fleeing the beleaguered euro, pushing the currency to levels that threatened to cripple Switzerland's export-driven economy.

Although Switzerland is best known for chocolates, watches, banking and Alpine resorts, midsize specialized companies form the backbone of a manufacturing industry that accounts for one-fifth of Swiss GDP. Exports produce half the GDP, with the euro zone by far its largest customer.

"The situation was extremely grave for exporters" in 2011, said Conrad Sonderegger, sales director at family-owned Kistler Instrumente AG, which makes high-tech sensors for automotive and plastics industries.

Based outside Zurich, Kistler employs 1,200 people, 500 in Switzerland. Mr. Sonderegger shifted production to Germany and the U.S. to cushion the blow from the high franc. "The worst part was the uncertainty," he said, "what would happen next."

The Swiss feared entire swaths of industry would disappear forever. "There is no way within one or two years to recover such an enormous amount of price competitiveness," said Hans Hess, president of Swissmem, which represents around 1,000 mechanical and engineering companies. "There was a risk that a significant number of Swiss export companies would either have been wiped out or have had to leave Switzerland."

The Swiss central bank began selling francs in 2009, when it cost 1.50 francs to buy one euro. But the franc kept rising, and central bank losses piled up. By August 2011, the flood of investor money had buoyed the currency 20% against the euro in just a few months. The franc was then worth one euro, a threshold that alarmed government and business leaders.

With its failure to restrain the franc's rise, the central bank's portfolio of foreign-currency assets in 2010 fell by 27 billion francs. In late 2011, the SNB—which, unlike most central banks, is partly owned by local governments—cut its annual dividend to 1 billion francs from 2.5 billion francs, triggering a political firestorm.
On Sept. 6, 2011, after secret consultations with central bankers in Frankfurt, London and Washington, the SNB took a bold step: It said it would go to any lengths printing and selling francs to keep its currency at least 1.20 francs to the euro.

The franc went from 1.10 to the euro to 1.20 in a matter of minutes, as hoped. To show its resolve, SNB placed a multibillion-franc sell order, pushing the franc to 1.24. It didn't need to take any more action for months; markets finally believed the central bank.

The architect of the bank maneuver, then-SNB chief Philipp Hildebrand, resigned after it was revealed his wife sold francs just before the bank's big move.

While the strategy is working, the SNB is constantly tested. To discourage global investors from putting money into franc accounts, Swiss commercial banks UBS AG UBS +0.61% and Credit Suisse Group AG CSGN.VX +1.23% announced last month they would charge a fee on some depositors rather than pay them interest.

The Swiss defense of its currency also has alarmed some ECB officials. Because the Swiss central bank will buy only the safest European government bonds, largely German and French, some ECB officials feared that big purchases would widen the gap between low interest rates markets accepted from Germany and the higher rates demanded of struggling Spain and Italy. To quell those fears, Mr. Hildebrand secretly agreed to deposit more than €50 billion, or about $65 billion, in a special account at the ECB to limit its bond-buying.

Mr. Hildebrand's successor Mr. Jordan, who had been his top lieutenant, continued the policy after taking the top post in January.

Because of market pressure on the franc, which waxes and wanes with the latest euro-zone headlines, he has done more franc selling than his predecessor and has increased the SNB’s exposure.

Unlike big private investors, the SNB can’t hedge its foreign-exchange risk. To limit its euro exposure, the SNB has moved to diversify and now holds 12% of its reserve in foreign equities, unusual for a central bank. It has traded euros for U.S. dollars, British pounds, Australian dollars and others.

Last year, it began buying South Korean won and recently said it would station seven people in Singapore to facilitate "round-the-clock operations" in foreign-exchange markets.

As of the end of September, the latest data available, 48% of its holdings were in euros—down from 60% at midyear—28% in U.S. dollars and 24% in other currencies.

"I never thought I would ever see such an anti-inflationary conservative institution as [the SNB] hold our currency as part of their reserves,” said Australian central banker Glenn Stevens. "It's a remarkable thing."