

MONETARY POLICY REPORT

March 2018



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*/ This is a translation of a document originally written in Spanish. In case of discrepancy or difference in interpretation the Spanish original prevails. Both versions are available at www.bcentral.cl.



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*/ The statistical cutoff date of this *Monetary Policy Report* was 15 March 2018. The *Report* also includes the publication of the National Accounts on 19 March and the monetary policy meeting held on 20 March.

PREFACE

The main objective of the Central Bank of Chile's monetary policy is to keep inflation low, stable, and sustainable over time. Its explicit commitment is to keep annual CPI inflation at around 3% most of the time, within a range of plus or minus one percentage point. To meet this target, the Bank focuses its monetary policy on keeping projected inflation at 3% annually over a policy horizon of around two years. Controlling inflation is the means through which monetary policy contributes to the population's welfare. Low, stable inflation promotes economic activity and growth while preventing the erosion of personal income. Moreover, focusing monetary policy on achieving the inflation target helps to moderate fluctuations in national employment and output.

The *Monetary Policy Report* serves three central objectives: (i) to inform and explain to the Senate, the Government, and the general public the Central Bank Board's views on recent and expected inflation trends and their consequences for the conduct of monetary policy; (ii) to publicize the Board's medium-term analytical framework used to formulate monetary policy; and (iii) to provide information that can help shape market participants' expectations on future inflation and output trends. In accordance with Section 80 of the Bank's Basic Constitutional Act, the Board is required to submit this *Report* to the Senate and the Minister of Finance.

The *Monetary Policy Report* is published four times a year, in March, June, September and December. It analyzes the main factors influencing inflation, which include the international environment, financial conditions, the outlook for aggregate demand, output, and employment, and recent price and cost developments. The last chapter summarizes the results of this analysis in terms of the prospects and risks affecting inflation and economic growth over the next eight quarters. Some boxes are included to provide more detail on issues that are relevant for evaluating inflation and monetary policy.

This *Report* was approved at the Board's session on 20 March 2018 for presentation on 21 March 2018.

The Board

SUMMARY

Activity growth has risen in recent months, particularly in non-mining sectors, which regained dynamism during the second half of 2017, after a sluggish beginning of the year. The external impulse has consolidated above expectations, with favorable financial conditions, the world growth outlook outperforming that of earlier years and commodity prices that have remained above year-before levels. Inflation has behaved in line with forecasts, hovering around 2%. Nonetheless, the convergence of inflation to 3% will take longer than was thought in December, because of the additional appreciation of the peso of the last few months. By 2019 and 2020, inflation should accelerate, largely because the economy will be closing its activity gap in a sustained manner, considering that, on average, the economy will be growing above potential over the period 2018-2020. The Board has kept the monetary policy rate (MPR) at 2.5% during the past few months and, in the baseline scenario, it estimates that it will keep the monetary stimulus near its current levels, and will begin to withdraw it as macroeconomic conditions consolidate the convergence of inflation towards 3%.

During recent months, annual CPI and CPIPE inflation have fluctuated around 2%, showing no big differences from December's projections. As has been the trend in recent quarters, the inflationary dynamic has been dominated by the appreciation of the peso. Annual CPIPE inflation for goods is slightly negative, while for the services component it has gradually decreased over the last year and now stands at around 3%.

In the baseline scenario, the convergence of inflation to 3% annually will occur as the activity gap continues to close and the real exchange rate returns to its long-term levels. However, this process will be somewhat slower than expected in December, mainly due to the effects of the aforementioned appreciation of the peso on tradable goods. Thus, in the coming months it is projected that annual inflation will fall temporarily, with an annual variation of the CPIPE standing around 1.5% by mid-2018. Afterwards, inflation will rise gradually returning to 3% towards the end of 2019 and hovering around that value throughout 2020. Inflation returning to the 3% level is consistent with an economy growing—on average—above potential in 2018-2020, thus closing the activity gap. Also, as a working assumption, the real exchange rate is projected to converge to its long-term levels over the same period.

INFLATION

	2017	2018 (f)	2019 (f)	2020 (f)
		(annual change, percent)		
Average CPI inflation	2.2	2.1	2.7	3.0
December CPI inflation	2.3	2.3	3.0	3.0
CPI inflation in around 2 years (*)				3.0
Average CPIPE inflation	2.0	1.6	2.6	3.0
December CPIPE inflation	1.9	2.1	3.0	3.0
CPIPE inflation in around 2 years (*)				3.0

(f) Forecast.

(*) Corresponds to inflation forecast for the first quarter of 2020.

Source: Central Bank of Chile.

**ECONOMIC GROWTH AND CURRENT ACCOUNT**

	2017	2018 (f)	2019 (f)	2020 (f)
		(annual change, percent)		
GDP	1.5	3.0-4.0	3.25-4.25	3.0-4.0
National income	2.8	3.7	3.8	3.6
Domestic demand	3.1	4.0	3.8	3.6
Domestic demand (w/o inventory change)	1.9	3.5	3.7	3.7
Gross fixed capital formation	-1.1	3.6	4.4	4.0
Total consumption	2.7	3.5	3.5	3.6
Goods and services exports	-0.9	5.0	3.5	2.6
Goods and services imports	4.7	7.1	3.7	2.5
Current account (% of GDP)	-1.5	-1.4	-1.7	-1.8
Gross national saving (% of GDP)	20.5	20.9	21.1	21.2
Gross national investment (% of GDP)	22.1	22.3	22.8	23.0
GFCF (% of nominal GDP)	21.6	21.3	21.6	21.9
GFCF (% of real GDP)	21.6	21.6	21.7	21.8
		(US\$ million)		
Current account	-4,192	-4,300	-5,500	-6,000
Trade balance	7,954	10,400	7,800	5,900
Exports	69,262	79,300	80,700	81,900
Imports	-61,308	-68,900	-72,900	-76,000
Services	-3,059	-3,000	-3,500	-3,200
Rent	-10,881	-14,000	-12,200	-11,100
Current transfers	1,793	2,300	2,400	2,400

(f) Forecast.

Source: Central Bank of Chile.

The close of the annual National Accounts showed average growth of 1.5% in 2017, in line with estimates in the last *Monetary Policy Report*. However, it also showed that while the first half of the year was worse than had been foreseen, the second half outperformed expectations, thanks mainly to non-mining activity. On the final domestic demand side, indicators showed minor differences, where worth noting was that investment picked up in the latter part of 2017, including construction and other works.

The better external scenario, the recovery of expectations, the favorable financial conditions and data for the end of 2017 have an incidence in the upward revision to the growth range forecast for 2018. Thus, the baseline scenario projects total GDP growing between 3.0 and 4.0% this year, which compares with the 2.5% to 3.5% range projected in December. Figures for the first part of the year will be significantly influenced by the low base of comparison left by *La Escondida* mine's shutdown in 2017 and fewer working days in the period. These effects will fade out during the year, moderating the growth rates.

The Board estimates that in 2019 GDP growth will be in the 3.25% to 4.25% range and in the 3.0% to 4.0% range in 2020. Therefore, it will grow above potential for several quarters, closing the activity gap towards early 2020. The Board continues to estimate current potential growth between 2.5% and 3%, and trend growth between 3% and 3.5%. The gradual recovery of higher GDP growth estimates leans on a favorable external scenario, a clearly expansionary monetary policy, the end of the adjustment in mining and housing investment, and the absence of significant macroeconomic imbalances. Estimates use as a working assumption that in 2018 the economy will receive a fiscal impulse in line with the approved budget. From then on, fiscal expenditure will expectedly follow the fiscal consolidation path described in the last *Public Finances Report*.

On the domestic demand side, these projections assume that consumption will gradually return to higher annual expansion rates, consistent with the increase in national income growth. On the investment side, after several years of contraction in gross fixed capital formation, it is expected to grow above GDP over the next three-year period. The stronger impulse from abroad will boost export growth. The current account will post deficits between 1.5% and 2% of GDP in these years, slightly higher than in 2017, in line with the greater investment expected in the new baseline scenario. These projections are consistent with the improvement in consumers and business expectations, which after several years returned to optimistic territory, and with private agents' growth prospects that have risen for both 2018 and 2019.

The external scenario has continued to improve over recent quarters. On one hand, actual and projected growth show a consolidation of good news for activity in the developed world. Thus, the performance that the U.S. has shown for some time now has coupled with better figures in the Eurozone and Japan. In the emerging world, China posted better than expected results in 2017, and has been able, so far, to handle appropriately the transition of its economic structure and

the weaknesses of its financial sector. Latin America, which looked more lagging in its recovery process, also shows better indicators in the margin and higher growth is expected for this year. With all these antecedents combined, Chile's trading partners should grow this year around 3.8%, exceeding the average of the last five years.

The developed economies' improved economic performance has led their central banks to implement less expansionary monetary policy stances, to varying degrees. Despite the associated risks, this has proceeded without significant stress in global financial markets. In fact, in the U.S., market expectations inferred from financial prices have been gradually approaching the trajectory announced by the Federal Reserve—which showed a faster withdrawal—and indicate that this year the policy rate will be raised at least three times. Long-term interest rates have seen significant increases in the United States and the Eurozone without causing any major inconveniences.

The evolution of the terms of trade has also improved over the last few quarters. In particular, the copper price, despite some ups and downs, has been sustained in over US\$3 per pound for several months and in the baseline scenario is expected to decline gradually and approach its long-term price, which is still estimated at US\$2.7 per pound. Thus, it should average US\$3.05 in 2018 and US\$2.95 in 2019, in both cases exceeding those considered in December. The oil price forecast is also increased, to US\$63 and US\$59 in 2018 and 2019, respectively.

About monetary policy, the Board assumes in the baseline scenario that by 2020 the MPR will hover around its neutral level, which it continues to place between 4% and 4.5%. A working assumption is that the monetary stimulus will be held around its current levels and will begin to be lowered as macroeconomic conditions consolidate inflation's convergence to 3%. The MPR trajectory, meanwhile, is similar to what is deduced from the surveys available at the statistical cutoff of this *Report*.

As usual, there are internal and external elements that could modify these projections. From the standpoint of its impact on the domestic economy, the risk balance in the external scenario has a downward bias. As a more positive scenario for global activity has materialized, the risks of a steeper Fed funds rate increase have risen. A faster inflation hike could force a faster withdrawal of the monetary stimulus. This could occur in a scenario of a more dynamic than expected demand, e.g., derived from the fiscal stimulus package being implemented. The resulting deterioration of global financial conditions could have particularly harsh consequences on those emerging economies whose fiscal or financial position is weaker or are highly indebted. China's situation is worrisome, as it is yet to resolve a number of imbalances in its markets. Any pitfalls in this process could have significant effects on the prices of global financial assets and commodities.

INTERNATIONAL BASELINE SCENARIO ASSUMPTIONS

	Avg. 00-07	Avg. 10-16	2017	2018	2019	2020
			(f)	(f)	(f)	(f)
	(annual change, percent)					
Terms of trade	8.2	1.1	9.0	2.5	-2.8	-1.7
Trading partners GDP (*)	3.7	3.9	3.6	3.8	3.6	3.4
World GDP at PPP (*)	4.5	3.8	3.8	3.9	3.8	3.6
World GDP at market exchange rate (*)	3.3	3.1	3.2	3.3	3.1	2.9
Developed economies' GDP at PPP (*)	2.4	1.7	2.2	2.3	2.0	1.7
Emerging economies' GDP at PPP (*)	6.5	5.2	5.0	5.2	5.0	4.8
External prices (in US\$)	4.6	0.4	3.7	5.4	1.9	1.8
	(levels)					
LME copper price (US\$/lb)	154	316	280	305	295	285
WTI oil price (US\$/barrel)	44	79	51	61	56	54
Brent oil price (US\$/barrel)	42	87	54	64	61	58
Gasoline parity price (US\$/m ³) (*)	366	657	466	517	488	471
Libor US\$ (nominal, 90 days)	3.6	0.4	1.3	2.1	3.0	3.6

(*) For definition, see glossary,

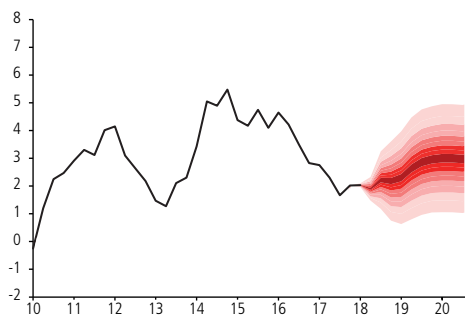
(f) Forecast.

Source: Central Bank of Chile.



CPI INFLATION FORECAST (*)

(annual change, percent)

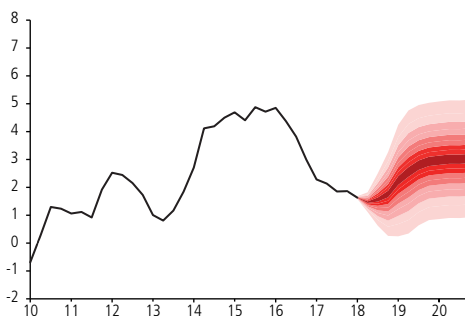


(*) The figure shows the confidence interval of the baseline projection over the respective horizon (colored area). Confidence intervals of 10%, 30%, 50%, 70% and 90% around the baseline scenario are included. These intervals are calculated using the RMSE of the MAS-MEP models for the 2009-2017 average and summarize the risks on future inflation as assessed by the Board. In the baseline scenario, the monetary stimulus will be held around its current levels and will begin to be lowered as macroeconomic conditions consolidate inflation's convergence to 3%.

Source: Central Bank of Chile.

CPIEFE INFLATION FORECAST (*)

(annual change, percent)



(*) The figure shows the confidence interval of the baseline projection over the respective horizon (colored area). Confidence intervals of 10%, 30%, 50%, 70% and 90% around the baseline scenario are included. These intervals are calculated using the RMSE of the MAS-MEP models for the 2009-2017 average and summarize the risks on future inflation as assessed by the Board. In the baseline scenario, the monetary stimulus will be held around its current levels and will begin to be lowered as macroeconomic conditions consolidate inflation's convergence to 3%.

Source: Central Bank of Chile.

Meanwhile, the US government has made protectionist announcements that might lead to an escalation of responses in other countries, affecting world trade. Beyond the short-term consequences, this type of measures could have negative effects on the world economy's and Chile's trend growth.

Regarding the domestic economy, the Board estimates that the risks to activity have an upward bias. The outlook for 2018 shows investment growing in line with GDP. However, it may show greater dynamism, considering the favorable external scenario, the expansionary monetary policy stance, the improved confidence indicators and data of recent months. This risk is tempered in part because of the stagnant creation of private salaried employment and the lower dynamism of nominal wages. In any case, different surveys show that expectations about employment have improved in recent months, in line with the better growth outlook.

Regarding inflation, the Board estimates that the risks are unbiased. The threats to its convergence to 3% have diminished, mainly due to the implications that the better economic outlook has on the process of closing capacity gaps. However, in the coming months the evolution of the exchange rate will cause inflation to be lower than expected in December, a situation that the Board will continue to monitor with special care, as it could have negative implications on the convergence of inflation to the target over the policy horizon. Accordingly, the Board reiterates its commitment to conduct monetary policy with flexibility, so that projected inflation stands at 3% over the two-year horizon.

MONETARY POLICY DECISIONS IN THE LAST THREE MONTHS

BACKGROUND: DECEMBER MONETARY POLICY REPORT

In the December *Monetary Policy Report*, the main change in the baseline scenario was inflation, which had surprised to the downside since September, primarily due to the behavior of fresh fruits and vegetables. Going forward, inflation was expected to converge to the target more slowly than previously foreseen due to the appreciation of the peso in recent months. Thus, inflation should stay around 2% in the first half of 2018 and return to 3% in the first half of 2019. Core inflation (CPIEFE) was expected to be lower than headline, converging to 3% in the second half of 2019. Local output had evolved in line with expectations, and the forecast had not changed significantly, thus output would grow 1.4% in 2017 and between 2.5 and 3.5% in 2018. The output gap should thus begin to close gradually after mid-2018, contributing to inflation convergence within the forecast horizon. This higher growth in 2018 relative to 2017 continued to be underpinned by a favorable external scenario, the end of the mining and housing investment adjustment, the absence of significant macroeconomic imbalances, and a clearly expansionary monetary policy.

Internationally, output had improved among Chile's main trading partners as financial conditions had remained favorable. The main change in the baseline scenario was an increase in commodity prices. The copper price had stayed above US\$3.00 a pound, but because there was still a high speculative position, the baseline scenario assumed that the copper price would fall to an average of US\$2.95 a pound in 2018 and US\$2.75 in 2019. The oil price and forecast had also risen, but was not enough to offset the copper effect, such that the terms of trade improved relative to September.

Regarding inflation, the baseline scenario assumed that fresh fruit and vegetable prices would return to a path more in line with their historical patterns, while energy prices would reflect the increase in external fuel prices. As a working assumption, the RER would depreciate slightly, thus converging to its long-term equilibrium level within the forecast horizon. Combined with the narrowing output gap, this would help bring inflation back to 3% in the second half of 2019, although it would remain around 2% in the short term. Given this outlook, the Board felt it was important to signal

that the downward trend in inflation in the short term should be carefully monitored, to the extent that inflation convergence could be affected by the weak output, low inflation, and—according to some measures—medium-term inflation expectations had been somewhat below 3%, thus affecting the inflation convergence, and in such case, a more expansionary monetary policy would be necessary. The working assumption in the baseline scenario was that the monetary policy rate (MPR) would be unchanged and would start to rise toward its neutral level only after the economy had begun to close the output gap.

The main external risks were still tied to the way and pace the monetary stimulus would be withdrawn in the developed world. While this process had thus far been carried out with great caution and the financial markets had remained calm, there was still a discrepancy between market expectations and the Federal Reserve's view, which was a source of considerable tension. Moreover, asset prices had been high from a historical perspective, and there could be a sharp reversal if global financial conditions tightened more than expected. Another concern was the low inflation in the developed world, despite greater output and higher energy prices. There was continued uncertainty surrounding fiscal and trade policy in the United States and the political situation in Europe, as well as the latent risk from China. Anyway, given the positive evolution of the world scenario in 2017, there was a possibility that higher growth would boost trade and investment at the global level. The copper price could be lower than forecast—due to financial factors—or it could stay high for some time, due to both supply and demand factors in the market.

With regard to Chile's GDP, the different spending components had remained out of sync, and, in particular, investment continued to lag. A less dynamic trend than expected in the short term could threaten the robustness and sustainability of the economic recovery in the medium term, given that the rise in confidence indicators mainly reflected a better outlook for the future rather than the current situation. In addition, vulnerability had increased in some bank lending segments. On the other hand, the cost of financing remained low from a historical perspective, which, together with the improved global scenario, could accelerate the recovery of investment. In this context, the Board's balance-of-risk assessment for both output and inflation was balanced.



DECEMBER AND JANUARY MEETINGS

For the December meeting, the output and inflation data released after the publication of the *Monetary Policy Report* tended to confirm the baseline scenario. The main difference was the increase in real interest rates, especially at longer terms. This trend had already been a source of concern at past meetings, in part because it was associated with a risk scenario of lower inflation expectations. In this regard, it was important to identify how much of the trend was due to factors that were specific to the bond market and how much it reflected a tightening of local financial conditions. The Bank's internal analysis suggested that to a significant degree, it was associated with changes in the pension fund administrators' portfolios. Other rates, like the equivalent swap, had moved less, and lending rates had fallen, as had corporate bond spreads. Furthermore, although breakeven inflation had decreased, other measures of expectations, such as surveys and spread-adjusted bond rates, had risen somewhat in the last month. Nevertheless, some measures two years ahead had been under 3% for some time. On the other hand, long-term rates could be expected to rise as the market converged to a growth scenario in line with the Bank's projections, and external long rates were also expected to increase.

In this context, the Research Division deemed that the two options presented at previous meetings remained valid: namely, holding the MPR at 2.5% or lowering it 25 basis points, to 2.25%, with a downward bias. Leaving the MPR at its current level was consistent with the baseline scenario in the *Monetary Policy Report*. However, there was a risk that the increase in real rates could pass through to other rates, tightening financial conditions in a context of weak output. On the other hand, the baseline scenario assumed that inflation expectations remained well-anchored, despite some shift for the medium term. Nonetheless, given the costs associated with a downward shift in inflation, expectations would have to be closely monitored, so as not to affect inflation convergence. With regard to the second option, the argument in favor of increasing the monetary stimulus rested mainly on risk management, but this was more difficult to communicate than a change in the baseline scenario. Moreover, the market was still expecting an economic recovery, which limited the negative effects of lower inflation expectations on the price formation process, especially when combined with a clear signal in the form of not initiating monetary policy normalization before the recovery took hold. Thus, the Board decided to hold the MPR at 2.5%.

For the January meeting, the data were in line with the baseline scenario in the *Report*. Locally, financial conditions were favorable. Starting in the second half of December, long-term rates, the stock market, and the exchange rate had all recorded a significant reversal of the trends observed at the previous meeting. Output data for

the fourth quarter of 2017 were somewhat better than projected, especially in sectors tied to investment. In addition, consumption remained quite dynamic in terms of durable goods purchases. There had not been any major inflation surprises, and annual headline and core inflation were both around 2%. The evolution of inflation continued to reflect the effects of exchange rate appreciation, sluggish economic activity, and some one-off shocks.

In this context, the Board considered the same monetary policy options analyzed at the last meeting: namely, holding the MPR at 2.5% or lowering it by 25 basis points, to 2.25%, with a downward bias. The arguments for holding the rate at its current level included the fact that the baseline scenario of the *Report* had strengthened since the previous meeting, due to both the evolution of the economy in the expected direction and the lower risks to inflation convergence. In fact, although inflation expectations for the short term had declined due to the appreciation of the peso, medium-term expectations had not changed significantly. This reflected a temporary effect from the adjustment in relative prices, which did not necessarily merit an increase in the monetary stimulus. The favorable external scenario also contributed to reducing the risks of a slower domestic economy recovery, as did the positive behavior of the local financial markets. The second option, in turn, was still valid for controlling possible risks to inflation convergence. While the risks had eased, they had not completely disappeared, especially in terms of risks deriving from persistently low inflation. In this sense, a reduction in the MPR would provide substantially more security and would provide better footing for facing potential risk scenarios. This additional support could be necessary in the event that consumption was affected by the slower recovery of the labor market and/or tighter credit, or in the event that the pressure on the exchange rate intensified. However, it was difficult to communicate decisions based on risk rather than on the baseline scenario, given that market expectations had largely incorporated the improved outlook for the macroeconomic scenario and the lower risks for inflation convergence. There was also the possibility that this option would be read as a more pessimistic turn in the Bank's outlook relative to the baseline scenario communicated earlier, which could adversely affect expectations that were only just beginning to leave pessimistic territory. Finally, in an environment of an improved outlook for the world economy, the market was likely to assume that a rate cut would be very short term, which would minimize the impact on the local economy. The Board therefore kept the rate at 2.5%.

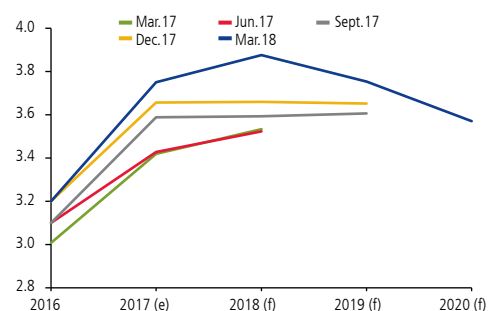
I. INTERNATIONAL SCENARIO

This chapter analyzes the recent evolution of the world economy and the outlook for the next two years. It also describes the most probable scenario and the main risks.

The international scenario has continued to improve over the past few quarters. The external stimulus has strengthened more than projected, with favorable global financial conditions, world growth that will be higher than in recent years, and higher commodity prices than a year ago, especially copper. This has occurred in a context in which the developed economies have proceeded with the monetary stimulus withdrawal process, with no major setbacks, or have at least moved forward on the discussion of its beginning. Nevertheless, there are still risks associated with this process. First, changes in macroeconomic conditions could lead the U.S. Federal Reserve (Fed) to raise its interest rate faster, stressing the financial markets. Second, if the substantial differences among some of these economies persist, it could generate significant reversals in the evolution of exchange rates at the global level. A third factor is the interaction between the tighter financial conditions and the ongoing weakness of various emerging economies. There is also considerable uncertainty surrounding the effects of the U.S. fiscal package and the trade policy measures announced by that country's authorities, in terms of both the effects on small open economies like Chile and the possible reactions of the main U.S. trading partners. The combination of better real data and more positive future outlook sets a better external baseline scenario, but the main risks are to the down side in terms of the effect on local economic activity.

World growth ended 2017 higher than projected, which, together with still-favorable fundamentals, translates into a better outlook than forecasted in December for this year and next (table and figure I.1). Output continued to become increasingly dynamic in the developed economies. In several countries, the strong performance of consumption was accompanied by improvements in investment and the external sector. GDP in the Eurozone obtained the best results of the last decade, with synchronized growth among countries, and recently, net exports saw an outstanding recovery (figure I.2). In the United States, consumption was dynamic, investment in fixed assets recovered at the margin, and the labor market remained very strong. At the same time, fiscal announcements should translate into an additional boost for demand. In Japan,

FIGURE I.1
Evolution of world growth forecasts in the *Monetary Policy Reports*
(annual change, percent)



(e) Estimate.

(f) Forecast.

Source: Central Bank of Chile.

TABLE I.1
World growth (*)
(annual change, percent)

	Avg. 00-07	Avg. 10-16	2017 (e)	2018 (f)	2019 (f)	2020 (f)
World at PPP	4.5	3.8	3.8	3.9	3.8	3.6
World at market FX rate	3.3	3.1	3.2	3.3	3.1	2.9
Trading partners	3.7	3.9	3.6	3.8	3.6	3.4
United States	2.7	2.1	2.3	2.7	2.3	1.9
Eurozone	2.2	1.1	2.3	2.2	1.9	1.7
Japan	1.5	1.5	1.7	1.3	0.8	0.5
China	10.5	8.1	6.9	6.6	6.3	6.2
India	7.1	7.3	6.6	7.3	7.6	7.6
Rest of Asia	5.2	4.6	4.3	4.3	4.3	4.2
Latin America (excl. Chile)	3.6	2.3	1.2	2.3	2.6	2.6
Commodity exporters	3.1	2.4	2.7	2.3	2.2	2.2

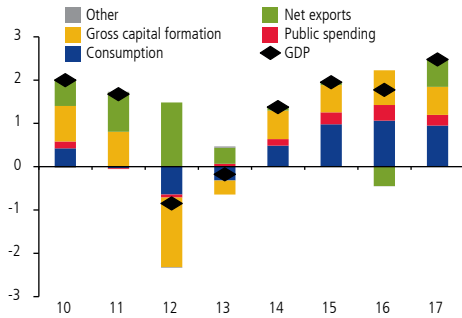
(*) See glossary for definitions.

(e) Estimate.

(f) Forecast.

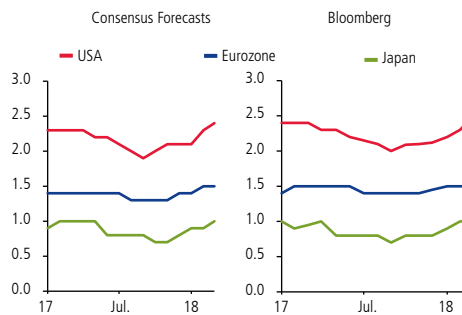
Sources: Central Bank of Chile, based on a sample of investment banks, Consensus Forecasts, IMF, and the statistics offices of each country.

FIGURE I.2
Eurozone: contribution of spending components to GDP growth
(average annual change, percent)



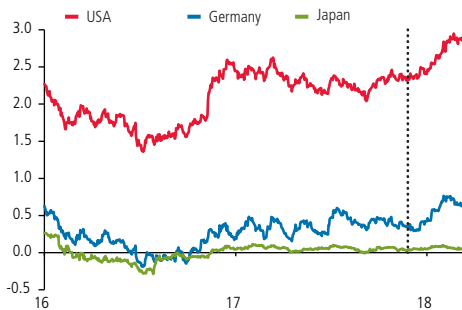
Source: Bloomberg.

FIGURE I.3
Inflation outlook for 2018
(percent)



Sources: Bloomberg and Consensus Forecasts.

FIGURE I.4
Ten-year government bond rates (*)
(percent)



(*) The vertical dotted line indicates the cutoff date of the December 2017 *Monetary Policy Report*.

Source: Bloomberg.

output remained dynamic, underpinned by external demand and favorable financial conditions, although the appreciation of the yen adds a note of caution to the evolution of the export sector. In the United Kingdom, in contrast, the uncertainty surrounding the Brexit negotiations contributed to slowing down economic activity in the past year.

Headline and core inflation remained low in most of the developed economies and were generally below their respective targets. However, given the more robust economic activity and little to no slack in the labor market, market inflation expectations for this year have been revised upward in some countries. Nevertheless, the evolution of wages remains weak in several economies and should be monitored. In the case of the Eurozone, there are also disinflationary effects from the appreciation of the euro. Thus, the market forecast for average annual inflation is slightly over 2% in the United States, around 1.5% in the Eurozone, and close to 1% in Japan (figure I.3).

With regard to monetary policy, the central banks in developed economies have been focusing increasingly on the monetary normalization process, although with varying intensity depending on the phase of the economic cycle. This has unfolded without generating any major disturbances in global financial conditions. In December, the Fed implemented its third increase in the federal funds rate for the year, as expected by the market. For this year, market expectations have aligned with the path announced by the Fed, pointing to three more hikes in the federal funds rate and increasingly incorporating the possibility of a fourth, in line with the evolution of output and inflation forecasts. The European Central Bank began to reduce its asset purchases in January of this year, while asset prices suggest that the monetary policy rate could begin to rise in the second half of 2019. The Bank of Japan, in turn, hinted that the monetary normalization process could start in 2019, when it suggested that its qualitative and quantitative stimulus measures could logically be set aside, given projections that inflation will reach the target in that period. In other economies, the central banks have continued to implement their normalization processes, including the Bank of Canada and the Swedish Riksbank.

The dollar has depreciated worldwide in recent months. Nevertheless, the baseline scenario contemplates a strengthening within the forecast horizon, supported by the effects of the strong fiscal stimulus and the adoption of protectionist measures in the United States, as well as a monetary normalization process that should continue to be faster relative to other developed economies. Long-term interest rates rose in the period (figure I.4). This, in a context where stock markets generally continued to post positive returns, credit spreads remained low, and volatility indicators remained low from a historical perspective, despite having increased (figure I.5). Taken together, these factors make up a scenario in which global financial conditions remain favorable from a historical perspective. In early February, there was an episode of increased volatility and sharp movements in risky-asset prices, which could have been related to the

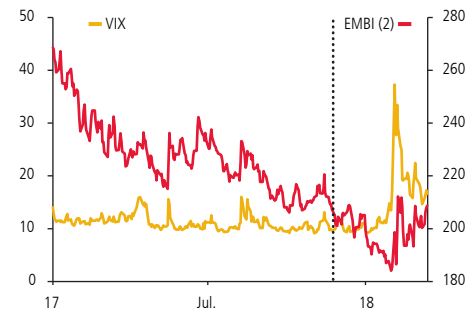
change in expectations for the speed of monetary policy normalization in the developed economies. The effects were short-lived, however, and thus far the data do not show a significant effect on real economic indicators. In fact, risk premiums have already started returning to their prior levels in several regions, and capital inflows continue to emerging economies, in particular Latin America (figure I.6).

In the emerging world, China ended 2017 with growth above projections and also above the 2016 level, which was particularly beneficial for other Asian countries (figure I.7). China's solid output performance took place amidst a sectoral rebalancing of the economy that has favored the services sector to the detriment of industry and investment. Going forward, the greater consumer confidence and the higher growth of disposable income are expected to continue to support private consumption, despite a reduction at the margin. In this context, the monetary authority has been able to increase interest rates and reduce liquidity injections, which has allowed it to control credit growth, at least partially. At its recent Annual Congress, the authority established an annual growth target of around 6.5% for this year, lowered the budget deficit target to 2.6% of GDP, and, in contrast with past meetings, did not set an investment goal for this year. Additional announcements included new attributions for the central bank and measures focused on financial stability. Risks remain, however, for this and other sectors of the economy. Thus, while the baseline scenario used in this *Report* incorporates an upward revision in the growth forecast for China for this year and next, the economy is still expected to gradually slow, consistent with the projected evolution of investment.

In Latin America output was higher in 2017 than in the previous year, with some variation among countries (figure I.8). This recovery is largely explained by greater world growth, better terms of trade for several economies, favorable external financial conditions for the region, and the strong monetary stimulus that is still being applied in some countries. Brazil recorded positive growth after two years of recession. In Mexico, fourth-quarter GDP saw a recovery from the slowdown triggered by natural disasters. In Colombia and Peru, output was weak in the last quarter of 2017, mainly due to the manufacturing sector and activities tied to the primary sector. Output also recovered in Argentina, although reducing inflation has proven more difficult than expected.

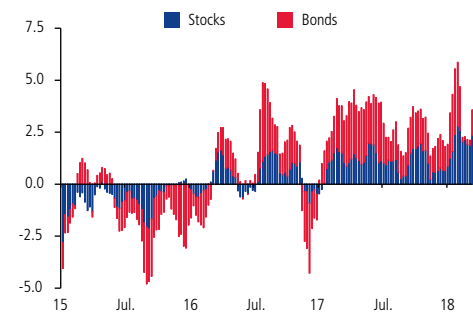
Most commodity prices have risen since the December *Monetary Policy Report*, mainly in response to the better world growth outlook and the depreciation of the U.S. dollar. The copper price stayed above the December forecast and even topped US\$3.10 a pound, although there was a lot of volatility in the period (figure I.9). In addition to the causes already mentioned, the manufacturing sector has been dynamic, and the market has been well supplied, although there is a risk of possible supply disruptions. The baseline scenario in this *Report* revises the average price forecast upward to US\$3.05 a pound for this year and US\$2.95 for next. The oil price rose to almost US\$65 a barrel for Brent and US\$61 for WTI (about 3.5 and 8.0% since the last *Report*, respectively).

FIGURE I.5
VIX and EMBI (1)
(basis points)



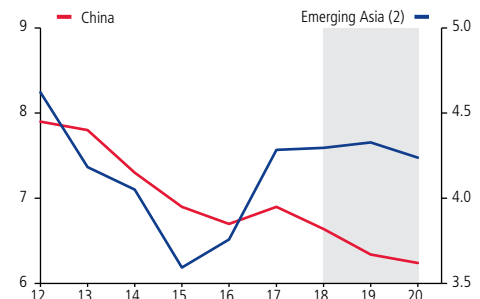
(1) The vertical dotted line indicates the cutoff date of the December 2017 *Monetary Policy Report*.
(2) Excluding Argentina and Venezuela.
Source: Central Bank of Chile, based on Bloomberg.

FIGURE I.6
Capital inflows to Latin America
(US\$ billion, moving month)



Source: Emerging Portfolio Fund Research.

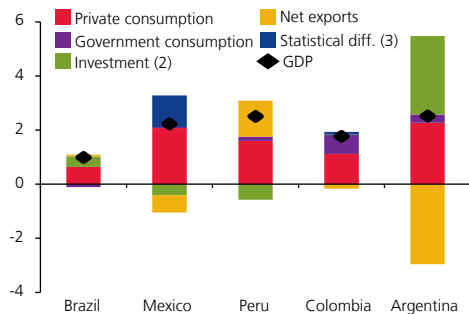
FIGURE I.7
China and emerging Asia: actual and forecast GDP (1)
(annual change, percent)



(1) The gray area indicates the forecast starting in 2018.
(2) Excluding China and India.
Source: Central Bank of Chile.



FIGURE I.8
Latin America: contribution of spending components to annual GDP growth in 2017 (1)
(average annual change, percent)



(1) For Brazil, Peru, and Colombia, average data through the fourth quarter of 2017; for Argentina and Mexico, through the third quarter.
(2) Gross capital formation.
(3) In Mexico, due to a methodological change.

Sources: Bloomberg and the central banks of Peru and Colombia.

FIGURE I.9
Commodity prices (1)
(US\$/barrel; US\$/lb)



(1) The vertical dotted line indicates the cutoff date of the December 2017 *Monetary Policy Report*.
(2) Simple average of the Brent and WTI barrel prices.

Sources: Bloomberg and Chilean Copper Commission (Cochilco).

The increase reflects the effect of some geopolitical conflicts and the over-fulfillment of quotas by OPEC members and other producers. However, the increase in production in the United States continues to set a price ceiling. The baseline scenario of this *Report* adjusts the average for Brent and WTI price forecast upward, to around US\$63 per barrel for this year and US\$59 for next year (versus US\$59 and US\$56 in the December *Report*).

As mentioned, the continuous improvement in the external scenario has given rise to risks that are mostly to the downside in terms of the impact on local economic activity. Among these, the evolution of the financial markets is particularly important, given the potential disturbances that could be triggered by a sharper normalization of the monetary stimulus in the developed economies, especially in the United States. The latter could arise in response to greater inflationary effects from the fiscal package announced by the current administration (box I.1). It could imply a deterioration in global financial conditions and put pressure on currencies, which would be particularly detrimental to emerging economies with less-than-solid financial or fiscal positions and high debt levels. The situation in China is another source of concern, to the extent that the economy has yet to resolve a number of market imbalances. Complications in this process could have significant effects on global financial asset and commodity prices.

Another key source of risk derives from the consequences of the protectionist trade policy measures being pushed by the U.S. administration. This might lead to an escalation of responses in other countries, with negative consequences for world trade and trend growth at the global level, especially in small open economies like Chile.

BOX I.1

POSSIBLE IMPACT OF RECENT FISCAL MEASURES IN THE UNITED STATES

In December 2017, the U.S. government approved a tax reform bill that included a corporate tax cut from 35 to 21%, an expansion of accelerated depreciation provisions, and tax incentives for the repatriation of capital. With regard to personal income taxes, rates were temporarily reduced in all of the seven tax brackets, standard deductions were increased, and some deductions were eliminated.

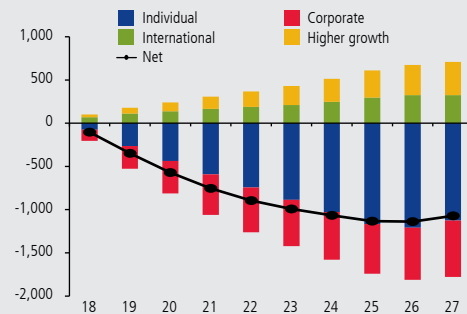
In addition to the reform, under the framework of the Budget Control Act of 2011, the spending limit for the 2018 and 2019 fiscal years was increased by nearly US\$400 billion, and the debt limit was suspended through March 2019. This is the biggest spending increase since the law was implemented. Finally, the administration proposed a budget for the 2019 fiscal year totaling US\$4.4 trillion, which represents an increase of 4.6% (nominal) over the 2018 budget. The higher spending would be partially offset by cuts to social and environmental programs, which could be difficult to be approved by the U.S. Congress. This box discusses the short- and medium-term effects that these recent fiscal measures in the United States could have on that economy and the potential risks for other markets.

Expected impact and transmission channels

According to estimates by the U.S. Congress Joint Committee on Taxation (JCT), the approved tax reform would imply a deterioration of the fiscal balance on the order of US\$1 trillion over ten years (figure I.10). When combined with the sanctioned increase in government spending, this could raise the fiscal deficit from 3.5% of GDP in the 2017 fiscal year to 5.7% in 2028, expanding the country's debt from 76 to 101% of GDP in the same period, according to the Committee for a Responsible Federal Budget.

Although the effects on growth are critical to the program's sustainability, they are not easy to estimate. The magnitude and timing of the impact of a change in the fiscal stimulus on output depend on the size of the fiscal multiplier, as well as on the nature of the stimulus and the circumstances under which it is applied. The estimated elasticities vary widely in different studies, depending on assumptions such as the level of the intertemporal substitution of consumption. If agents believe that such a program will require a later fiscal adjustment, they will save today to prepare for that eventuality. This phenomenon is known in the literature as Ricardian equivalence.

FIGURE I.10
Accumulated effect of the tax reform on the fiscal balance (*)
(US\$ billion)



(*) There could be differences between the sum of the individual effects and the net due to rounding.

Source: U.S. Joint Committee on Taxation (JCT).

Official government estimates assume a growth rate of 3.0% per year over the next ten years, based on the positive effects that the program could have on productivity. Maintaining this rate would require a significant increase in potential growth, which currently would be between 1.8 and 1.9%, according to the IMF and the U.S. Congressional Budget Office (CBO), respectively. Although they do not change significantly potential GDP growth, the IMF and other organizations recently updated their growth forecasts to incorporate an increase of around 5 tenths for 2018 and 2019, which is attributed in part to the reform. The cyclical acceleration from the fiscal stimulus should push the unemployment rate down, putting upward pressure on wages and prices. This could trigger a more aggressive reaction by the Fed, hastening the normalization of the reference rate; which in turn would intensify the pressure on term premiums, deriving from the larger supply of fixed-income securities (to finance the deficit) and the lower participation by the Fed in the Treasury bond market (due to its balance sheet normalization process).

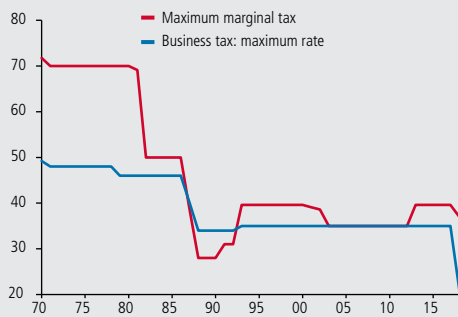
Higher inflation expectations, higher real and nominal rates, and greater demand pressure on nontradable goods, due to the expansion of spending, should contribute to an appreciation of the dollar. This trend would be reinforced if the U.S. economy also moves in the direction of closing its economy to international trade. This combination of movements in asset prices was observed after Trump won the election in November 2016. Although breakeven inflation and interest rates have both increased since the tax reform, the dollar has moved in the opposite direction.

Previous episodes and potential risks

This is not the first time that the U.S. economy has implemented tax cuts of this sort (figure I.11). In recent history, there are at least two important cases. The first involves the tax cuts carried out by the Reagan administration, which reduced the maximum personal income tax rate from 70% to 50% in 1981 and then to 28% in 1986. The business tax rate was also lowered in 1986, from 46 to 34%. The second episode occurred under George W. Bush, who reduced the maximum personal income tax rate from around 40 to 35% in 2001 and 2003.

FIGURE I.11

Tax rate (percent)



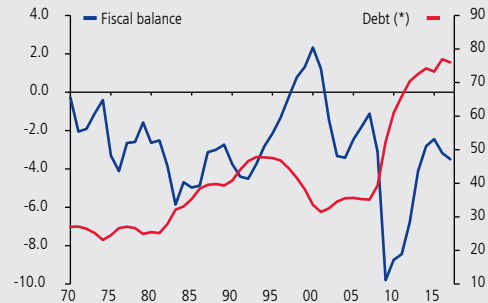
Source: U.S. Internal Revenue Service (IRS).

In both episodes, fiscal spending increased and government revenues decreased, causing a significant expansion of the fiscal deficit and public debt (always as a percent of GDP). Although the private sector adjusted under the Bush administration, partially offsetting the fiscal stimulus, both episodes produced a deterioration of the current account. The inflationary effects were limited in both episodes due to excess capacity and low energy prices. GDP growth increased in both cases, but from relatively weak levels, which allowed monetary policy to remain relatively expansionary. The latter was critical for minimizing movements in long rates.

Under both programs, the point of departure was very different from the current scenario. The fiscal deficit was nonexistent at the start of the Bush era, and the public debt was significantly lower than current levels in both cases (figure I.12). Another point of contrast is the phase of the economic cycle. Whereas the economy was relatively weak and unemployment high during the previous episodes, the opposite is true today.

FIGURE I.12

Fiscal balance and debt (percent of GDP)



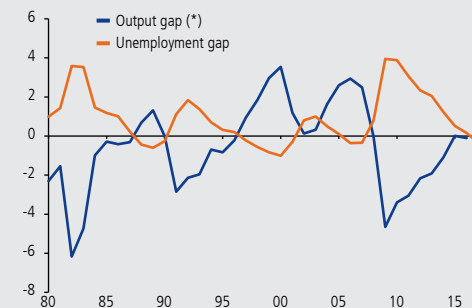
(*) Debt is "held by the public."

Source: U.S. Congressional Budget Office (CBO).

Is this a good time to stimulate the economy? A fiscal stimulus, in the context of an economy with little excess capacity (figure I.13) and a high debt level, will generate higher inflation and macroeconomic imbalances that will require adjustments in the medium term. The recent dynamics of the dollar, opposite its fundamentals, could reflect investors' lack of confidence in the fiscal sustainability of the United States. This could lead them to require additional compensation for holding assets in that currency, thereby increasing the premium for external financing. Thus, the interaction between monetary and fiscal policy is especially delicate during this phase of the cycle. A scenario in which the Fed delays normalization could generate asset price bubbles, while an energetic response by the Fed to neutralize the fiscal stimulus could induce an excessive asset price correction and an increase in volatility. Consequently, the lack of coordination between fiscal and monetary policy in the United States is one of the main risks identified in this Report.

FIGURE I.13

Excess capacity (percent)



(*) Percent of potential GDP. Point indicates a forecast for 2017.

Sources: IMF and CBO.

II. FINANCIAL MARKETS

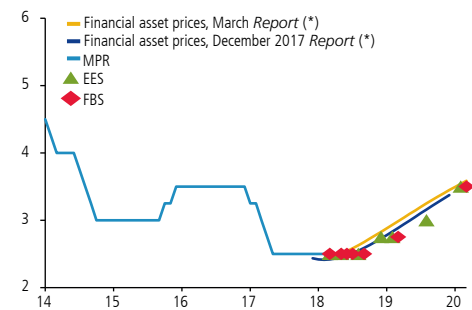
This chapter reviews the evolution of local financial markets in connection with the transmission of monetary policy.

MONETARY POLICY

Locally, the data released since the last *Monetary Policy Report* show that the economy grew more than projected in the second half of 2017. This has unfolded in a context where global output and the terms of trade have evolved favorably, financial conditions remain loose, and local confidence indicators are recovering. Thus, GDP is expected to grow between 3.0 and 4.0% in 2018. Headline inflation has followed a path in line with expectations and remains around 2% in annual terms. It is expected to decline temporarily in the coming months, due to the appreciation of the peso, and then to converge to 3% toward the end of 2019. A key factor in the latter process will be the closure of the output gap over the course of this year and next.

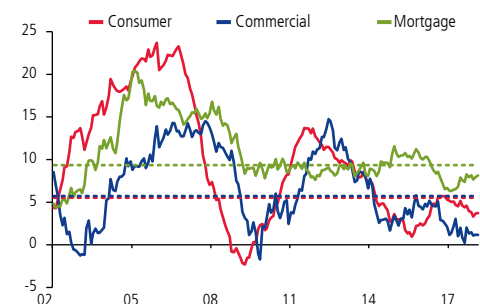
The monetary policy rate (MPR) has stayed at 2.5% since May 2017. As of the cutoff date for this *Report*, market expectations for the MPR contained in the different surveys—the Financial Brokers Survey (FBS) and the Economic Expectations Survey (EES)—anticipate that the rate will essentially be stable throughout this year and will reach 3.5% toward the end of the policy horizon. Financial asset prices suggest the same endpoint, with increases starting in the third quarter of this year (figure and table II.1). As a working assumption, the monetary stimulus is expected to remain around its current level, and its withdrawal will start once macroeconomic conditions begin to consolidate inflation convergence to 3%. For the MPR, this path is similar to expectations deduced from the surveys available as of the cutoff date of this *Report*. In the baseline scenario, the Board considers that the MPR will be near its neutral level around 2020, estimated at 4.0 to 4.5%.

FIGURE II.1
MPR and expectations
(percent)



(*) Constructed using interest rates on swap contracts up to 10 years.
Source: Central Bank of Chile.

FIGURE II.2
Real growth of loans (1) (2)
(annual change, percent)

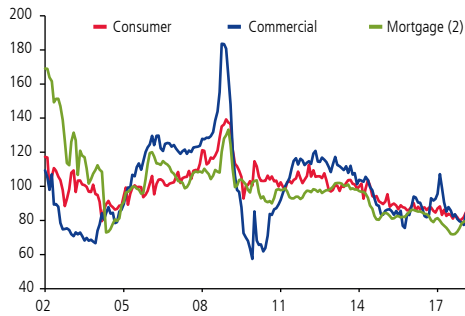


(1) Real data constructed by splicing the 2013 base year CPI.
(2) Horizontal dotted lines indicate the average of the last 10 years for each series.

Source: Central Bank of Chile, based on SBIF data.

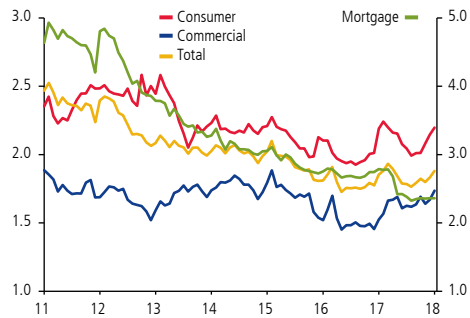


FIGURE II.3
Interest rates, by type of loan (1)
(index: 2002–2018=100)



(1) Weighted average rates of all operations in the month.
(2) Mortgage interest rates are in UF.
Source: Central Bank of Chile, based on SBIF data.

FIGURE II.4
Delinquency of 90 days or more, by portfolio
(percent of respective loans)



Source: Central Bank of Chile, based on SBIF data.

TABLA II.1
MPR expectations
(percent)

	One year ahead		Two years ahead	
	December Report	March Report	December Report	March Report
EES (1)	2.75	2.75	3.25	3.50
FBS (2)	2.50	2.75	3.00	3.50
Financial asset prices (3)	2.73	2.99	3.37	3.59

(1) November 2017 and March 2018 surveys.
(2) Surveys for the second half of November 2017 and the first half of March 2018.
(3) The December and March *Monetary Policy Reports* use the average of the last ten business days as of 27 November 2017 and 15 March 2018, respectively.
Source: Central Bank of Chile.

FINANCIAL CONDITIONS

Local credit is similar to previous quarters, with low interest rates, in general, and limited loan growth (figures II.2 and II.3). The mortgage portfolio continues to be marked by more dynamic lending, as well as a gradual increase in mortgage interest rates in recent months (almost 35 basis points between September and February). Consumer and commercial loan rates have risen recently, but largely due to seasonal and compositional factors. With regard to qualitative sources, the *Business Perceptions Report* (BPR) describes a relaxation of lending requirements for residential loans—in particular, the down payment—and an increase in mortgage applications. The Bank Lending Survey (BLS) for the fourth quarter does not show any changes in lending requirements, with slightly stronger household demand (consumer and mortgage loans), while the corporate side is about the same as in the last *Report*.

The low cost of the different types of credit was also mentioned in the BPR, where interviewees highlighted again the favorable bank financing conditions for lower-risk clients and the loosening of approval standards by car loan providers. In general, survey responses from the banking sector do not suggest any major concerns about delinquency or default, although this was an important issue in the northern regions of the country in 2017. In those regions, slow payment by large corporations is a source of concern, due to the negative effect on the rest of the local economy. Traditional banking default indicators remain low, despite an increase in recent months in the consumer and, to a lesser extent, the commercial segment (figure II.4).

External financial conditions remain favorable. A comparison of the cutoff dates of this and the last *Reports* shows that most stock exchanges improved, risk premiums generally narrowed, and capital continued to flow into emerging

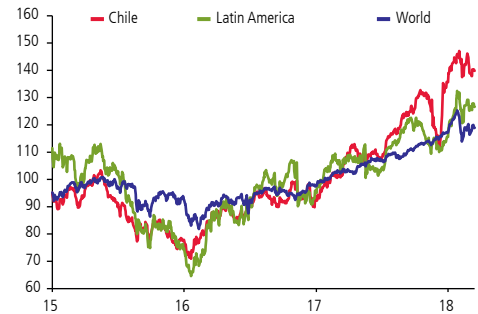
economies. The U.S. dollar depreciated at the global level, reaching the lowest level since late 2014. The markets' doubts about the fiscal sustainability in the United States, as well as the more marked improvement in data from other developed countries, could be behind the weakening of that currency. Its fundamentals, in any case, suggest pressures in the opposite direction. These include a more expansionary U.S. fiscal policy, a higher inflation outlook, and changing perspectives on monetary policy. The changes in monetary policy expectations also triggered turbulence in the global markets in early February, which caused sharp corrections in risky-asset prices and an increase in volatility. These movements had eased significantly as of the cutoff date of this Report. In this context, long-term interest rates rose in the developed world, especially in the United States (on the order of 50 basis points since the December Report).

In the last three quarters, the Chilean financial market has been influenced by both global developments and changes in local economic perspectives. Starting in the second half of 2017, the stock market (IPSA) has increased more than similar exchanges. It reached a new peak after the publication of the December Report, completing two years of favorable performance, albeit with some fluctuations. In this period, the market rose around 80% in dollars, versus 70% in Latin America and 30% worldwide (MSCI) (figure II.5). By economic sector, most recorded increases.

The Chilean peso has appreciated more strongly than comparable currencies thus far in the year. In the days prior to the cutoff date, the nominal exchange rate was around \$600 pesos to the dollar. The strengthening of the local currency reflects a number of factors, in particular the global dollar depreciation trend and the higher copper price, which has stayed over US\$3.00 a pound (figure II.6). The interest rate differential between Chile and the United States, although theoretically relevant, is empirically less important for explaining exchange rate movements (box IV.1). Domestic factors have also played a role. Most importantly, the country's economic performance and outlook have been improving. There were also some short-term factors. For example, in January and February the decrease in the exchange rate coincided with carry trade operations, foreign flows for corporate acquisitions, PFA portfolio adjustments, and the entry into the market of the funds deriving from the Treasury debt issue. The peso has been fairly volatile in recent quarters, peaking at \$650 in December, dropping below \$590 in February, and quickly changing direction after just a few days. Exchange rate fluctuations have been somewhat milder in Latin America and in several emerging economies in recent months (table II.2). Thus, multilateral measures of the peso (MER, MER-X, and MER-5) appreciated more modestly in the period, relative to the bilateral exchange rate against the U.S. dollar.

FIGURE II.5

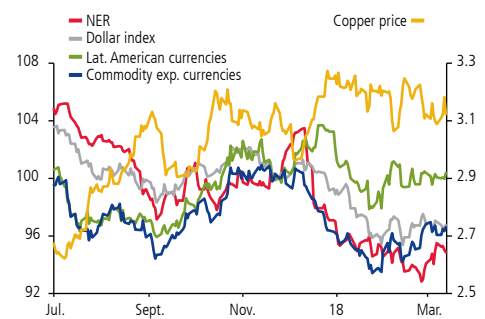
Stock market (*)
(index: 2015–2018=100)



(*) Chile: IPSA; other exchanges: MSCI. Both are measured in dollars. Source: Bloomberg.

FIGURE II.6

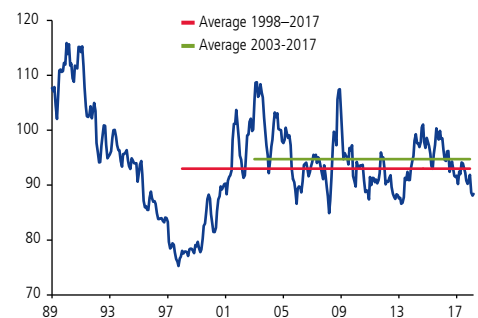
Nominal exchange rate
(cutoff of Dec. 2017 Report=100; US\$/pound)



Sources: Central Bank of Chile and Bloomberg.

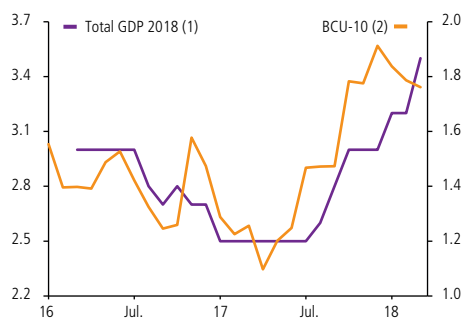
FIGURE II.7

Real exchange rate, RER (*)
(index: 1986=100)



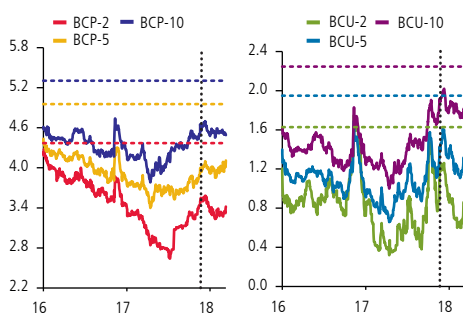
(*) Data for February 2018 are a preliminary estimate; data for March 2018 are through the cutoff date. Source: Central Bank of Chile.

FIGURE II.8
Annual growth outlook and 10-year UF bond rate (percent)



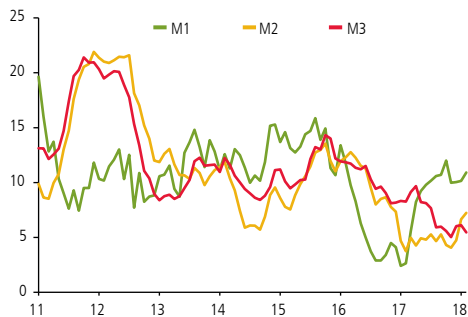
(1) Economic Expectations Survey.
(2) March 2018 uses the average of daily data through the cutoff date.
Source: Central Bank of Chile.

FIGURE II.9
Interest rates on Central Bank of Chile bonds (1) (2) (percent)



(1) The vertical dotted line indicates the cutoff date of the December 2017 Monetary Policy Report.
(2) Horizontal dashed lines indicate the average of the last 10 years for each series.
Source: Central Bank of Chile.

FIGURE II.10
Nominal monetary aggregates (*) (annual change, percent)



(*) Monthly daily averages.
Source: Central Bank of Chile.

TABLE II.2
Exchange rates against the U.S. dollar (1) (percent)

	Change in NER Report, March 2018			
	Report Dec.17	Report Sept.17	Report Jun.17	Report Mar.17
Latin America (excl. Chile) (2)	-0.9	2.9	0.0	1.1
Brazil	-0.2	3.0	0.2	4.6
Chile	-5.1	-6.4	-10.4	-9.4
Colombia	-4.8	-3.7	-1.7	-2.4
Mexico	-0.9	5.4	0.3	-2.2
Peru	0.5	0.5	-0.5	0.1
Commodity exporters (2)	-3.9	-0.4	-5.6	-3.7
Australia	-2.9	1.3	-4.8	-2.1
Canada	1.2	2.8	-4.5	-3.4
New Zealand	-5.8	-0.2	-4.1	-3.6
South Africa	-15.8	-9.9	-9.6	-6.8
Developed economies (2)	-4.6	-4.3	-8.1	-10.9
Eurozone	-4.4	-4.2	-9.5	-12.9
Japan	-5.3	-2.9	-4.8	-5.3
United Kingdom	-4.6	-7.3	-6.8	-10.7
Other emerging economies				
China	-4.4	-4.9	-8.0	-8.2
South Korea	-2.4	-5.4	-4.5	-5.0
India	0.1	1.5	0.7	-0.7
Indonesia	1.8	3.1	3.4	3.2
Poland	-4.9	-5.7	-9.3	-14.5

(1) A positive (negative) sign indicates a depreciation (appreciation) of the currency against the U.S. dollar. For comparison, the calculation uses the last ten business days prior to the statistical cutoff of each Report.
(2) Includes the currencies of the economies included in this table. Constructed using the weights in the WEO, October 2017.

Sources: Central Bank of Chile, Bloomberg, and International Monetary Fund.

In this scenario, the real exchange rate (RER) has decreased in recent quarters, fluctuating just under 90 (where 1986=100) around the cutoff date of this Report (figure II.7). As a working assumption, the baseline scenario considers that the RER will converge to its long-term value over the course of the 2018–2020 period.

The external rate movements and the improvement in the local growth outlook have been reflected in the fixed-income market, which have also been influenced by the changes in the PFA portfolio (figure II.8). With regard to nominal interest rates, the BCP-10 increased around 40 basis points since mid-2017, although it remains below its historical average, as do shorter nominal bond rates (figure II.9). In the same period, the rates on UF-denominated securities were fairly volatile, due to the changes in outlook and the inflation surprises, as well as the PFA portfolio adjustments in more recent months. According to different measures, both sovereign and corporate spreads fell in recent months. This has tended to offset the increase in BCP and BCU rates, such that the cost of financing for firms has not varied much.

With regard to the nominal monetary aggregates, the more liquid aggregates—M1 and M2—recorded high growth rates. In February, the annual growth rates were among the highest of recent months (10.9 and 7.2%, respectively; 12.0 and 4.3% in October) (figure II.10). In M1, the fastest-growing component was checking accounts; in M2, time deposits. The annual growth rate of M3 stayed around 6%, albeit with fluctuations, based on a comparison of the cutoff dates of this and the last Reports. In this aggregate, the effect of the growth of M2 was offset by a smaller contribution from foreign currency deposits, due to the exchange rate trend, and from private sector holdings of General Treasury and Central Bank bonds, given the PFA portfolio shifts.

BOX II.1

EFFECTS OF U.S. MONETARY POLICY NORMALIZATION ON LOCAL FINANCIAL MARKETS

The consolidation of growth in developed countries and the normalization of their interest rates present important challenges for monetary policy conduct in Chile. Like many small, open, and financially integrated economies, Chile is affected by the so-called global financial cycle—fluctuations in capital flows, asset prices, and lending conditions with a high degree of comovement between countries—which is largely determined by the monetary policy of the main developed economies.

How the global financial cycle affects local financial conditions depends on monetary and exchange rate policy, among other factors. In particular, under free capital mobility, a flexible exchange rate regime (like Chile's) helps cushion the impact of the global financial cycle on local financial conditions by allowing central banks to set their monetary policy rate independently and thus to adjust the cost of credit for firms and households to an appropriate level for the country's economy^{1/}.

This box presents evidence on the transmission of global financial conditions to a broad set of countries, documenting how changes in U.S. monetary policy affect long-term interest rates, exchange rates, and capital flows in a group of developed and emerging economies. The evidence shows that the exchange rate is less reactive in emerging than developing economies, but the effects on capital flows and long rates are larger. Moreover, in emerging economies, changes in long rates are primarily explained by movements in term spreads and not by changes in the monetary policy rate, in contrast to what happens in developed economies. These results are consistent with studies that emphasize the role of the exchange rate regime in the transmission of external financial shocks—namely, that a flexible exchange plays a role in mitigating (though not eliminating) the effects of external shocks on local financial conditions.

^{1/} This perspective, however, has been questioned by some studies that hold that the local impact of the global financial cycle does not depend on the exchange rate regime, such that the monetary policy independence associated with a flexible exchange rate regime would be fairly insignificant (Rey, 2016).

International monetary policy transmission: theory and evidence

The impact of changes in global interest rates on local interest rates depends on the reaction of local monetary policy, among other factors. For example, in a context of financial integration and free capital mobility, an increase in the U.S. monetary policy rate will create an incentive for capital to flow into that country. Under a floating exchange rate regime, equilibrium is reestablished as the local currency loses value (depreciates) against the dollar, which makes local assets cheaper and thus more attractive, which in turn reduces the incentive for capital outflows from the local economy. The exchange rate will fluctuate less if the local central bank decides to move interest rates in the same direction as the U.S. Federal Reserve (Fed), because higher interest rates are another way to make local investment more attractive. Thus, economies that want to maintain control of their monetary policy, in the sense of being able to move their interest rate independently of what the Fed does, will generally have to tolerate wider fluctuations in the exchange rate. In this context, maintaining the independence of the policy interest rate while at the same time using other instruments to avoid exchange rate fluctuations, such as sterilized interventions, has the problem of not providing a disincentive for capital outflows and is thus difficult to maintain over time. It could also affect other asset prices, such as long-term bonds^{2/}.

Understanding the effect of changes in U.S. monetary policy on local long-term rates is somewhat more complex, since it depends not only on monetary policy today, but also on how the market expects the central bank to react in the future. These rates also depend on so-called term premiums, that is, the extra compensation that investors require to hold longer-term instruments, to offset interest rate and inflation risk. Thus, the change in long rates in reaction to U.S. monetary policy will depend on a series of factors that make it difficult to predict a priori the intensity of the movements.

^{2/} According to the empirical evidence, sterilized interventions generally have very limited and very short-term effects (Adler and Tovar, 2014; Daude et al., 2016). Their impact is greater when there is a significant misalignment of the exchange rate vis-à-vis its fundamentals.



Albagli et al. (2018) study the transmission of U.S. monetary policy shocks^{3/} to ten-year rates in a broad sample of emerging and developed economies. Table II.3 shows the pass-through coefficients of the shocks for each group of economies, together with the decomposition into the expected monetary policy rate and the term spread. The last row of the table shows the exchange rate impact in the same two-day window. The results confirm that a U.S. monetary policy shock has a significant positive effect on the international rate structure. A monetary policy shock of 100 basis points leads to an increase in the ten-year rate of 33 basis points in developed countries and 29 basis points in emerging economies. These effects are stronger in the period after the global financial crisis.

Although the reaction is similar in the two groups, there are important differences in the adjustment mechanism. In developed countries, the biggest impact is on the expected monetary policy rate. In emerging economies, transmission occurs mainly through changes in the term premiums. With regard to the exchange rate, the exercises show that it reacts more in developed than emerging economies. One possible explanation is that central banks in the emerging countries in the sample are more likely to use sterilized interventions, in order to stabilize interest rates and the exchange rate at the same time^{4/}. However, the data also show that they were only partially successful, since it is precisely in this group of countries where long-term rates react the most to changes in U.S. monetary policy (table II.3). Although the markets in these economies appear to anticipate smaller changes in the monetary policy path than in the developed economies (the effect on the expected rate component is weak), the strong reaction of the term premiums generates significant changes in their long rates.

Blanchard et al. (2015) provide a possible explanation for this phenomenon. They show that sterilized interventions in foreign exchange markets can soften exchange rate fluctuations in the short term, but this amplifies the resulting capital flows. This is due to the fact that international investors respond more sharply to rate differentials when the exchange rate impact of their asset purchases—and the effect on the price in dollars—is contained by the sterilized interventions.

Along the same lines, Albagli et al. (2018) show that the amplifying effect of interventions on capital flows translates

^{3/} The shocks are defined as changes in the yield on the two-year U.S. Treasury bond in a window of two days around the date of the Fed's meeting.

^{4/} The empirical evidence shows that the emerging economies in the sample intervene often, whereas the developed countries do not. Ghosh et al. (2017) and Fratzscher et al. (2017) discuss evidence on the frequency of intervention and the exchange rate effects.

TABLE II.3
U.S. monetary policy spillovers (*)

	Developed economies		Emerging economies	
	2003-2016	Post Nov. 08	2003-2016	Post Nov. 08
10-year rate	0.335***	0.429***	0.293***	0.557***
Expected rate component	0.331***	0.234***	0.054	0.136**
Term premiums component	0.005	0.196***	0.239***	0.421***
Exchange rate depreciation	7.50***	10.92***	3.52***	6.66**

(*) The sample includes 12 emerging and 12 developed economies. The panel regressions use daily data from January 2003 to December 2016. The units represent effects in basis points for a one-basis-point U.S. monetary policy shock. ***, **, *: significant at the 1, 5, and 10% confidence level, respectively.

Source: Albagli et al. (2018).

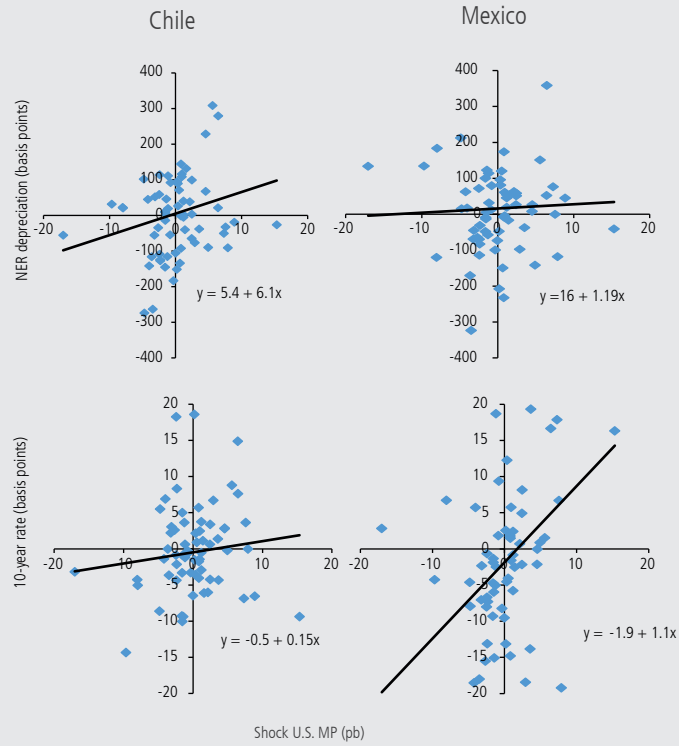
into a bigger response from the term spread component of long rates. They also confirm the findings of Blanchard et al. (2015), empirically documenting that capital inflows to fixed-income markets react more to U.S. monetary policy shocks in emerging countries than in the sample of developed economies. Obstfeld et al. (2018) reach similar conclusions, showing that in a sample of emerging economies, the effects of global financial shocks on local financial markets is milder in countries with a more flexible exchange rate regime. Here, it is worth noting that Chile stands out among emerging countries for its floating exchange rate policy. Figure II.11 shows the reaction of ten-year rates and the local exchange rate to U.S. monetary policy shocks, with Mexico included for comparative purposes. The exchange rate impact is relatively high for Chile, with an elasticity of almost 6.0 (versus 1.2 for Mexico), but there is only a limited effect on rates, with an elasticity of 0.15 (versus 1.1 for Mexico)^{5/}.

Conclusions

The recent evidence suggests that the transmission of international financial conditions to small, open, financially integrated economies is significant. However, the evidence also suggests that the design of macroeconomic policies is crucial for attenuating the impact on local financial markets. In particular, exchange rate flexibility tends to contain capital flows and their impact on local financial asset prices. The evidence for Chile confirms this prediction, highlighting the role of the floating exchange rate regime in mitigating international shocks.

^{5/} For more information on the foreign exchange intervention policy of the Bank of Mexico, see <http://www.banxico.org.mx/informacion-para-la-prensa/comunicados/politica-cambiarial/comision-de-cambios/index.html>.

FIGURE II.11
Exchange rate and long rate spillovers (*)



(*) An increase in the exchange rate indicates a depreciation of the local currency against the dollar. The sample is the post–November 2008 average.

Source: Albagli et al. (2018).

III. OUTPUT AND DEMAND

This chapter reviews the recent evolution of output and demand and their short-term outlook, in order to examine possible inflationary pressures.

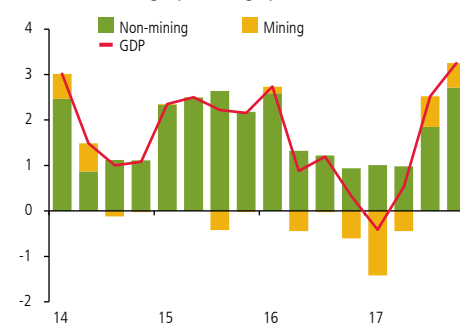
Annual GDP growth was 1.5% in 2017, in line with the forecast in the December *Report*. However, the annual closing of the national accounts, usually in March, had a downward revision in growth for the first half of 2017, together with higher-than-projected growth in the second half, in particular for non-mining activity. On the domestic spending side, the data revealed minor differences, most notably a recovery of investment, including construction and other works. In the baseline scenario, domestic demand is expected to continue following a more dynamic trend. Private consumption is also expected to reach annual growth rates around 3.5%, in line with the higher growth of the real wage bill, in part, because wages return to growth rates around the historical average. The recovery of demand is further underpinned by an improvement in consumer and business confidence, a better external scenario, and a clearly expansionary monetary policy.

As a result, the GDP growth forecast has been revised upward for 2018, to a range of 3.0 to 4.0%. In the first part of the year, growth rates will be influenced by the low basis for comparison left by the strike at *La Escondida* mine in 2017 and the shorter number of business days. These effects will diminish over the course of the year, causing growth rates to slacken. Nevertheless, the assessment of the current state of the output gap has not changed significantly, despite a somewhat different dynamic since December. In particular, the narrowing of the gap is expected to be stronger in the second half of this year.

OUTPUT AND DOMESTIC DEMAND

In the second half of 2017, output grew 2.9% annually, on average, picking up considerably compared with the null growth in the first half. This is explained by both a recovery of production levels in the mining sector, which fell sharply in the first part of the year, and an upswing in the non-mining sectors, where the annual growth rate increased around 1.5 percentage points, on average, in the second half of the year.

FIGURE III.1
Contribution to annual GDP growth
(real annual change, percentage points)



Source: Central Bank of Chile.

TABLE III.1
Gross domestic product
(share of GDP; real annual change, percent)

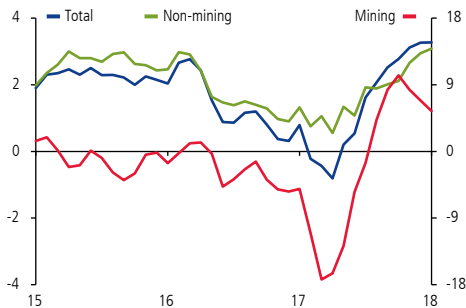
	Share, 2017	2016				2017			
		I	II	III	IV	I	II	III	IV
Agriculture, livestock, and forestry	3.1	7.8	-3.3	-2.6	6.3	-3.9	-1.5	-2.7	-0.7
Fishing	0.7	-4.8	-14.4	-21.9	-7.8	43.6	11.5	23.9	4.6
Mining	10.1	0.9	-4.8	-1.5	-5.5	-17.4	-5.5	8.3	6.8
Manufacturing	10.2	0.2	-4.3	-2.8	-2.5	0.1	0.5	2.6	3.5
EGW and waste management	3.1	10.5	10.8	-2.1	-7.8	1.0	2.5	3.8	5.4
Construction	6.5	4.0	1.5	3.6	2.3	0.1	-4.7	-5.3	-0.1
Trade	9.2	2.5	3.2	2.2	2.2	2.9	2.3	4.6	4.7
Restaurants and hotels	2.1	1.9	-1.0	-0.5	0.8	-0.2	1.3	1.5	2.1
Transport	5.1	3.4	3.2	4.2	2.6	1.0	1.4	3.3	3.8
Communications and information services	2.6	2.8	2.0	3.2	2.5	2.3	3.8	4.6	4.9
Financial services	4.5	4.8	3.9	3.5	3.4	2.6	3.8	5.1	3.3
Business services	9.7	-1.0	-2.3	-3.5	-3.5	-5.7	-3.0	-0.4	1.2
Residential property and real estate services	7.8	2.9	4.1	2.6	2.6	3.5	2.7	2.9	2.3
Personal services (*)	11.9	5.3	5.9	5.5	3.2	3.3	2.8	2.8	4.1
Public administration	4.7	3.5	3.8	3.1	2.2	1.4	2.4	1.9	1.9
Total GDP	100.0	2.7	0.9	1.2	0.3	-0.4	0.5	2.5	3.3
Non-mining GDP	89.9	2.9	1.5	1.4	0.9	1.1	1.1	2.0	2.9
Mining GDP	10.1	0.9	-4.8	-1.5	-5.5	-17.4	-5.5	8.3	6.8

(*) Includes education, health, and other services.

Source: Central Bank of Chile.



FIGURE III.2
Monthly economic activity index (*)
(annual change, percent)



(*) Three-month moving average.

Source: Central Bank of Chile.

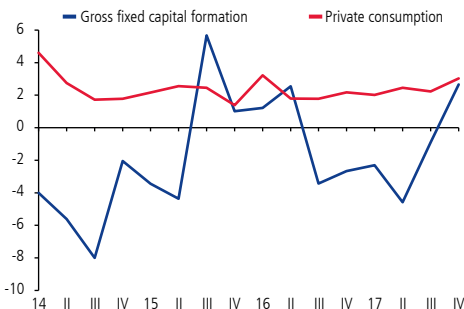
TABLE III.2
Domestic demand
(share of GDP; real annual change, percent)

	Share					2016				2017			
	2017	I	II	III	IV	I	II	III	IV	I	II	III	IV
Domestic demand	98.3	2.7	1.1	0.7	0.9	2.5	3.6	2.2	4.0				
Domestic demand excluding inventories	97.8	3.0	2.8	1.3	1.2	1.3	1.1	1.8	3.0				
Gross fixed capital formation	21.6	1.2	2.5	-3.4	-2.7	-2.3	-4.6	-0.9	2.7				
Construction and other works	13.7	1.2	-1.2	-1.2	-1.4	-4.7	-6.7	-5.9	-1.7				
Machinery and equipment	7.9	1.0	10.2	-7.4	-4.9	1.8	-0.8	8.1	10.8				
Total consumption	76.2	3.6	2.9	2.8	2.5	2.4	2.8	2.5	3.1				
Private consumption	62.3	3.2	1.8	1.8	2.2	2.0	2.5	2.2	3.0				
Durable goods	5.7	8.8	3.7	3.4	3.8	11.5	10.9	12.2	7.8				
Nondurable goods	26.3	2.6	1.2	1.3	2.2	2.0	2.3	2.1	2.7				
Services	30.3	2.8	2.0	1.9	1.9	0.4	1.1	0.7	2.4				
Government consumption	14.0	5.8	8.2	7.5	3.9	5.0	4.3	3.7	3.4				
Change in inventories (*)	0.5	0.0	-0.5	-0.6	-0.7	-0.4	0.2	0.3	0.5				
Goods and services exports	28.7	0.7	1.0	0.2	-2.3	-4.4	-4.4	2.7	2.5				
Goods and services imports	27.0	-0.1	1.4	-0.5	0.0	5.6	6.3	2.0	5.2				
Total GDP	100.0	2.7	0.9	1.2	0.3	-0.4	0.5	2.5	3.3				

(*) Ratio of inventory change to GDP, at average prices of the previous year, accumulated in the last 12 months.

Source: Central Bank of Chile.

FIGURE III.3
Components of final demand
(real annual change, percent)



Source: Central Bank of Chile.

In the fourth quarter of 2017, non-mining GDP grew more than in previous quarters, thanks to a better performance by investment-related sectors, such as construction and business services. In addition, the industrial sector recorded higher growth in most production lines. At the same time, consumption-related sectors maintained a more favorable relative performance. Mining GDP, in turn, continued to grow at high rates, although somewhat lower than in the previous quarter: 6.8% annually. Thus, GDP grew 3.3% annually in the last quarter of 2017 (figure III.1 and table III.1). With regard to the first output data for 2018, the Imacec grew 3.5% annually in January, due to a better performance by both the mining and non-mining sectors, mainly trade, manufacturing, and services (figure III.2).

On the domestic spending side, the second half of the year was marked by a more favorable investment trend (table III.2 and figure III.3). The annual growth rate of gross fixed capital formation (GFCF) turned positive in the last quarter of 2017, after contracting for several quarters. By component, construction and other works remained weak, although the annual contraction slowed. For machinery and equipment, the growth rate rose to double digits (figure III.4). The first data released for the first quarter of 2018 show that capital goods imports (excluding uncommon transport vehicles) are around the same level as in late 2017.

The construction and other works component of investment recorded an easing of its annual contraction in the fourth quarter of 2017. Going forward, this component is expected to recover moderately. On the one hand, most short-term indicators continue to show a modest performance (figure III.5). On the other, different sources of information—such as the cadastral survey carried out by the Capital Goods and Technological Development Corporation (*Corporación de Desarrollo Tecnológico y de Bienes de Capital, CBC*), the investment plans of firms listed on the IPSA, or interviews carried out for the *Business Perceptions Report (BPR)*—do not point to an additional acceleration in the coming quarters. The residential sector continues to be characterized by ample supply, according to CChC data, while the months to sell through inventory remain above the average of the last ten years. In terms of qualitative information, most of the interviews for the February BPR suggest that activity in the residential sector has probably bottomed out, and new projects are expected to start up in the second half of 2018, once the large stock of available dwellings is sold.

The annual growth rate of private consumption increased in the fourth quarter, largely due to higher growth of routine consumption. Durable goods sales continue to be driven by cars. Early data for 2018 point to a similar scenario to 2017: new car sales (ANAC) grew over 20% annually in January and February, while consumer imports grew 15 to 20%. In terms of qualitative information, BPR interviews in the retail sector provide mixed assessments of sales. Some people reported a recovery since late 2017, while others said that sales were lower than expected and in some cases had even contracted. In the automobile market, most interviewees cited a good performance, associated with more flexible credit and more price discounts than in past years.

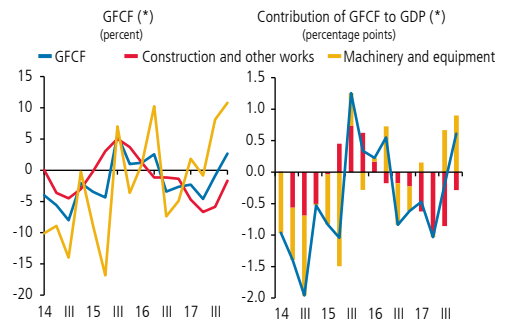
Consumption has evolved in line with its determinants. The growth rate of real labor income, measured through the real wage bill, declined to 3.5% annually in the fourth quarter, although it remains around the average of the last ten years. The slowdown in the growth rate of the real wage bill reflects lower growth of real wages, on average, than in the third quarter, because nominal wages are growing less than they would under the usual indexation clauses. Thus, real wages have slowed over the past few months, and the growth rate is now below the average of the last years. With regard to employment, the growth rate has increased slightly, and in contrast to previous quarters, the growth of self-employment slowed, while wage employment increased. The latter, however, reflects an increase in public jobs, whereas private employment continues to stagnate (figure III.6). The unemployment rate remains low from a historical perspective, at around the same level as of a year ago and on the cutoff date of the last *Report*. Qualitative information shows that both consumer expectations (IPEC) and business expectations (IMCE) for the future employment trend has improved. This coincides with the findings of the February BPR, where several interviewees mentioned that they intended to start hiring in the near future, as new investment projects came on line or sales improved. This largely reflects the fact that companies are operating with minimal staff. At any rate, the ongoing weakness of private wage employment and the low growth of wages raise a note of caution on future consumption.

Consumer expectations (IPEC) and business expectations (IMCE excluding mining) have both returned to optimistic territory, after several years in negative territory (figures III.7 and III.8). In particular, business expectations have improved in all sectors, with industry and trade in optimistic territory. Similarly, in the last BPR, interviewees expressed positive expectations for their businesses and for the economy in general. The majority expect business to pick up markedly toward the second half of the year, although current sales remain largely unchanged.

Financial conditions are similar to the past few quarters, with low interest rates and limited loan growth in general. The mortgage portfolio continues to be stand out vis-à-vis other segments, with more dynamic lending and a gradual increase in relevant mortgage rates in recent months.

With regard to the external sector, exports continued to increase in the second half of 2017 in terms of both price and volume (figure III.9), driven by the improved performance in the mining and industrial sectors. Imports also increased, but to a lesser magnitude than exports. Thus, the 2017 trade balance showed a larger surplus than the previous year. This surplus was more than offset by the increase in profit remittances, in line with the higher copper price, which brought the current account deficit to 1.5% of GDP at year-end.

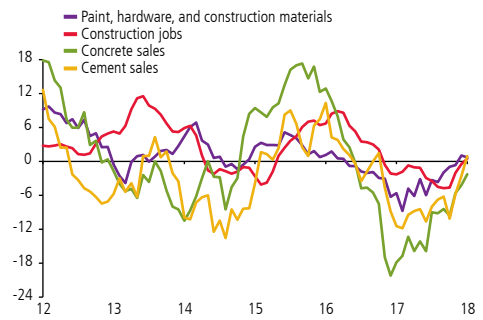
FIGURE III.4



(*) Real annual change.
Source: Central Bank of Chile.

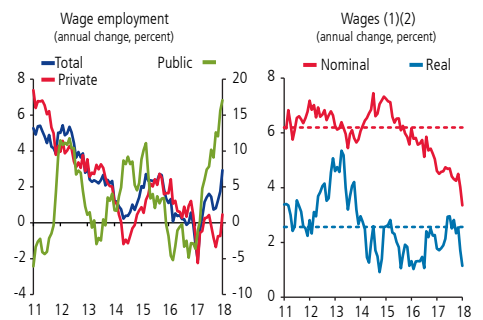
FIGURE III.5

Construction and building indicators (*)
(annual change, percent)



(*) Three-month moving average.
Sources: Central Bank of Chile, Chilean Chamber of Construction (CChC), and National Statistics Institute (INE).

FIGURE III.6



(1) Nominal (real) wages: simple average of annual changes in the nominal (real) wage index (IREM) and labor cost index (ICMO).
(2) Slashed lines indicate the 2017 average.
Sources: Central Bank of Chile and National Statistics Institute (INE).



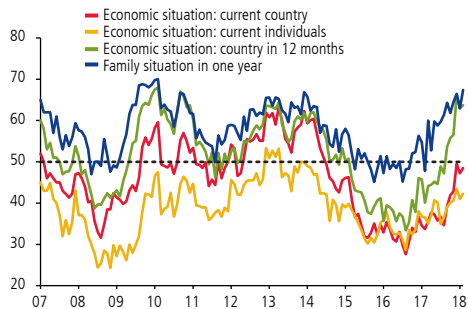
FIGURE III.7
Business expectations: IMCE (1)
(original series)



(1) Simple average of trade, construction, and industry. A value over (under) 50 indicates optimism (pessimism).
(2) Construction sector: expectations on the company's financial situation.

Source: Icare/Universidad Adolfo Ibáñez.

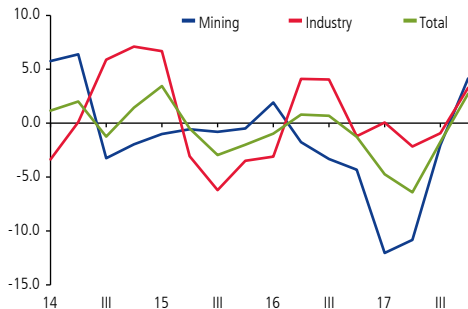
FIGURE III.8
Consumer expectations: IPEC (*)
(original series)



(*) A value over (under) 50 indicates optimism (pessimism).

Source: Adimark.

FIGURE III.9
Volume of goods exports (*)
(annual change, percent)



(*) Two-quarter moving average.

Source: Central Bank of Chile.

OUTLOOK

The baseline scenario in this *Report* assumes that the economy will grow between 3.0 and 4.0% in 2018, which is higher than in the December *Report*. This reflects the better real output data since late 2017, as well as the combination of a stronger external stimulus, the recovery of consumer and business confidence, and a clearly expansionary monetary policy. The GDP growth forecast for 2019 is 3.25 to 4.25%; for 2020, 3.0 to 4.0%. The economy will thus grow above potential for several quarters, with the output gap closing in early 2020. The Board continues to estimate that potential growth is currently 2.5 to 3.0%, while trend growth is 3.0 to 3.5%.

Private growth expectations have been revised upward in recent months. The Economic Expectations Survey (EES) for March 2018 projects an annual growth rate of 3.5% for this year, 5 tenths higher than in the December EES. For the first quarter of the year, the expected growth rate was revised upward from 3.1 to 3.9% annually. The growth forecast was also revised for 2019, from 3.3 to 3.7% annually. For 2020, the expected annual GDP growth rate is 3.8%.



BOX III.1 MINING PRODUCTIVITY IN CHILE

Mining productivity in Chile

Traditional growth accounting exercises, which calculate the evolution of total factor productivity (TFP) as the residual of a production function with constant returns to scale with physical capital and labor as inputs, show that TFP in the mining sector fell almost 9% a year, on average, between 2002 and 2015. Given the importance of mining in aggregate GDP, this phenomenon has been identified as risk factor for long-term growth (OECD, 2018). In fact, different measures suggest that total TFP had a strong impact in this period^{1/}. However, this type of exercise is not entirely appropriate for non-renewable natural resource sectors, since it generates significant biases in the measure of sectoral and aggregate productivity. This happens for two fundamental reasons. First, the natural process of non-renewable resource depletion translates into rising production costs, which are incorrectly associated with lower TFP growth. Second, ignoring this factor leads to a wrong interpretation of the contribution of physical capital, thereby distorting the TFP estimate.

This box documents the importance of including non-reproducible capital in the analysis of aggregate and mining TFP and compares the Chilean experience with other copper-producing countries. Natural (non-reproducible) capital is measured using the ore grade at copper mines. The results show that the decline in ore grade plays a very important role in the evolution of value added (VA) in the the mining sector. The traditional growth exercise exaggerates the contribution of reproducible capital significantly and underestimates the growth of TFP. Finally, similar results are found on comparing the evolution of mining TFP in Chile with other copper-producing countries.

^{1/} For recent estimates of mining productivity, see Corbo and Gonzalez (2014), Magendzo and Villena (2016), Commission and the National Productivity Commission (*Comisión Chilena del Cobre* and *Comisión Nacional de Productividad*, 2016) and the National Copper Commission (*Comisión Nacional de Productividad*, 2017).

Growth accounting in the mining sector

The standard way to measure TFP growth is to calculate the difference between effective growth and growth deriving solely from the accumulation of productive factors. The idea is that if effective output is higher (lower) than the growth associated with factor accumulation, then TFP should have increased (decreased). That is,

$$\Delta\text{PTF}=\Delta Y - (\alpha\Delta L+(1-\alpha)\Delta K)$$

where ΔTFP is the growth of TFP (in percent); ΔY , of value added; ΔL , of labor; and ΔK , of physical capital, that is, of machinery, equipment, and engineering works. The shares of labor and capital in production are given by the parameter α , which measures the labor share of income.

Mining is not very labor intensive, so the value of α is low, at just 0.13^{2/}. This implies that a 1% increase in employment would generate 0.13% of growth in the sector, whereas a 1% increase in capital would increase production by 0.87%. From 2002 to 2015, the sector saw a strong increase in capital, associated with the investment boom of those years, and average annual growth of 10%. Employment grew 2.6% per year. Thus, based solely on the accumulation of productive factors, value added of mining would be expected to have grown 9.1%. In contrast, effective growth averaged just 0.5%, which suggests that productivity declined 8.6% (table III.3)^{3/}.

^{2/} That is, in the mining sector, the payment to labor is 13% of value added, versus 53% in the non-mining sectors.

^{3/} For details on this exercise, see De La Huerta, and Luttini (2018).

TABLE III.3
Growth in the mining sector: traditional growth accounting

	VA	SPTF	K	H
Chile	0.50	-8.64	8.81	0.34
Average: Australia, Canada, Chile, and Peru	2.51	-5.37	6.81	1.08
Average (*)	0.95	-5.31	5.43	0.83

VA is Δy_t , SPTF is $\Delta \text{sptf}_t^{\text{Traditional}}$, K is $(1-\alpha)\Delta k_t$ and H is $\alpha \Delta h_t$.

(*) Simple average of Australia, Canada (excluding the oil sector), Chile, Peru, and South Africa, which are all metal producers, and Colombia, Ecuador, Indonesia, Malaysia, Mexico, and Norway, which are hydrocarbon producers.

Source: De la Huerta and Luttini (2018).

But did productivity actually fall so quickly in the sector? The problem with the above exercise is that it does not explicitly recognize the role of natural capital, which generates two problems. First, it does not take into account the direct effect of the lower ore grade, which implies that a given quantity of material processed yields a smaller amount of copper. Second, it leads to an overestimation of the importance of physical capital in production, which is particularly important in this period given the growth of mining investment.

To address this problem, the following exercise explicitly incorporates the non-renewable resource as a third productive factor^{4/}. Specifically, the growth accounting formula now includes the contribution of different mine ore grades (ΔR), whose share (μ) is estimated at 0,65^{5/6/}. That is,

$$\Delta \text{PTF} = \Delta Y - (\alpha \Delta L + \mu \Delta R + (1-\alpha-\mu) \Delta K)$$

The inclusion of ore grade significantly changes the interpretation of the period. First, the share of physical capital in GDP growth falls significantly, from 0.87 to 0.22^{7/}. Thus, the increase in production deriving from capital accumulation would be only 2.2%. Second, the mining resource depletion process, which is reflected in the declining ore grade, significantly reduces the growth derived from factor accumulation, because $\Delta R = -4.2\%$. Thus, the results of the adjusted growth accounting exercise show that the accumulation of the three productive factors is associated with a growth of mining value added of -0.18% annually. This implies that TFP grew 0.68%, on average, in these years (table III.4).

^{4/} Corbo and Gonzalez (2014), Magendzo and Villena (2016), Commission and the National Productivity Commission (*Comisión Chilena del Cobre* and *Comisión Nacional de Productividad*, 2016) and the National Copper Commission (*Comisión Nacional de Productividad*, 2017) use production functions with constant returns to scale to analyze the mining sector. The present work uses a methodology similar to Nordhaus (1992), Caselli and Feyrer (2007), Monje-Naranjo et al. (2016), and Brandt et al. (2017).

^{5/} Ore grade is the concentration of gold, silver, copper, tin, etc. present in the rocks and mineralized material of a mine.

^{6/} See De la Huerta and Luttini (2018).

^{7/} Now, a 1% increase in capital is associated with just 0.22% higher value added. That is, $(1-\alpha-\mu)$, instead of $(1-\alpha)$.

TABLE III.4
Growth in the mining sector: augmented growth accounting

	VA	SPTF	K	H	Ore grade
Chile	0.50	0.68	2.20	0.34	-2.72
Average: Australia, Canada, Chile, and Peru	2.51	1.77	1.35	1.08	-1.68

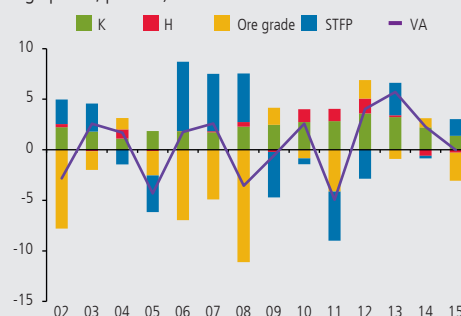
VA is Δy_t , SPTF is $\Delta \text{sptf}_t^{\text{Traditional}}$, K is $(1-\alpha)\Delta k_t$, H is $\alpha \Delta h_t$, and ore grade is $\gamma \Delta r_t$.

Source: De la Huerta and Luttini (2018).

International comparison and the cyclical behavior of TFP

Similar results are found for a set of countries where the mining sector is similar to Chile. Although the sector's value added is less dynamic in Chile in the period, this is largely explained by low mining TFP growth, at less than half the group average. Furthermore, and in line with the predictions of non-renewable resource exploitation models, the decline in the ore grade is greater in upward phase of the commodity price cycle, the 2002–2011 period, and lower in the downward phase (figure III.10). Finally, the growth of mining TFP is weakest during the peaks of the super-cycle (2008–2012), with a subsequent recovery, consistent with the trend in other countries^{8/}.

FIGURE III.10
Mining sector value added
(percentage points, percent)



Source: De la Huerta and Luttini (2018).

^{8/} The results of the adjusted exercise—the importance of the declining ore grade; the much more limited contribution of reproducible capital; the absence of a dramatic fall in TFP—are robust to different values for the ore grade share. The comparison with similar exercises carried out by the Chilean Copper Commission and the National Productivity Commission (*Comisión Chilena del Cobre* and *Comisión Nacional de Productividad*, 2016) and the National Copper Commission (*Comisión Nacional de Productividad*, 2017)—while indirect due to methodological differences—also shows the importance of explicitly considering ore grade to understand growth in the sector.



Non-mining and aggregate growth accounting

The inclusion of a natural capital measure also has an important effect on the measure of value added of the economy. Once the contribution of ore grade is taken into account, the interpretation of the sources of growth in Chile changes significantly. Ore grade depletion alone contracts aggregate output by 0.38% a year (table III.5). The ore grade effect generates a loss in production in Chile that is above the average of the other mining countries analyzed. Finally, when ore grade is explicitly incorporated into the aggregate production function, aggregate TFP growth is closer to non-mining TFP growth.

TABLA III.5
Aggregate growth: augmented growth accounting

	VA	SPTF	K	H	Ore grade
Chile					
Non-mining	4.68	1.62	2.07	0.99	
Aggregate	4.09	1.20	2.44	0.83	-0.38
Average: Australia, Canada, Chile, Peru					
Non-mining	3.69	0.99	1.74	0.95	
Aggregate	3.66	0.84	2.20	0.80	-0.18

VA is Δy_t , SPTF is $\Delta sptf_t^{Traditional}$, K is $(1-\alpha)\Delta k_t$, H is $\alpha \Delta h_t$, and ore grade is $\gamma \Delta r_t$
Fuente: De la Huerta y Luttini (2018).

Conclusions

This box shows that the incorporation of natural capital as a productive factor has a first-order impact on the interpretation of the sources of economic growth in mining economies in general and in Chile in particular. Concretely, omitting natural capital leads to an exaggeration of the contribution of reproducible capital and an underestimation of TFP growth. Once natural capital is incorporated, the contributions of TFP and reproducible factors in the mining and non-mining sectors are more balanced. The growth of mining TFP is seen more dynamic than suggested by the traditional approach—in fact positive. However, average growth is lower than in comparable countries.

IV. PRICES AND COSTS

This chapter analyzes the recent evolution of the main components of inflation and costs, identifying the current sources of inflationary pressure and their likely evolution in the future.

In recent months, annual CPI and CPIPE inflation were stable at around 2%, in line with projections in the December *Report* (figure and table IV.1). As has been the pattern over the past year, annual CPIPE services inflation has gradually slowed, while the goods component remains negative. In both components, the dynamics have been influenced by the output gap and the exchange rate trend, with the latter being a more important factor for goods inflation. Regarding the more volatile items, fresh fruits and vegetables, increased the annual inflation rate and again contributed to total inflation. The baseline scenario assumes that annual inflation will temporarily decrease in the immediate term, to then settle around 2% through the first quarter of 2019. It will rise to 3% toward the end of 2019 and hold at that level throughout 2020. Annual CPIPE inflation will stand around 1.5% by mid-2018, due mainly to the effects of the peso appreciation in recent months, and then rise to 3% in a two-year horizon.

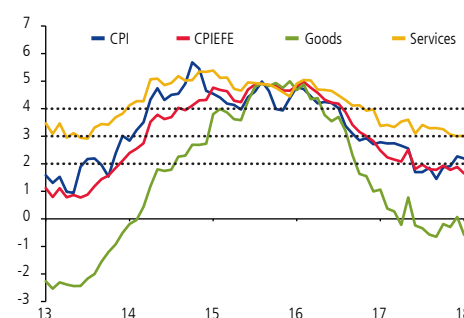
TABLE IV.1
Inflation indicators (*)
(annual change, percent)

	CPI	CPIPE	Goods	Services	Food	Energy
2014 avg.	4.4	3.6	1.6	4.9	6.9	5.5
2015 avg.	4.3	4.7	4.4	4.9	7.2	-4.5
2016 avg.	3.8	4.0	3.2	4.5	3.8	1.8
2017 Jan.	2.8	2.5	1.1	3.4	2.5	6.4
Feb.	2.7	2.2	0.4	3.4	3.5	5.6
Mar.	2.7	2.2	0.3	3.3	3.7	5.7
Apr.	2.7	2.1	-0.2	3.5	4.2	4.1
May	2.6	2.5	0.8	3.6	2.6	2.8
Jun.	1.7	1.8	-0.2	3.1	1.3	1.6
Jul.	1.7	2.0	-0.3	3.4	1.0	1.1
Aug.	1.9	1.8	-0.6	3.3	1.2	4.1
Sept.	1.5	1.8	-0.6	3.3	-0.4	3.4
Oct.	1.9	1.9	-0.2	3.3	0.8	4.1
Nov.	1.9	1.8	-0.3	3.1	1.6	3.9
Dec.	2.3	1.9	0.1	3.0	2.5	5.3
2018 Jan.	2.2	1.6	-0.6	3.0	3.9	3.0
Feb.	2.0	1.6	-0.4	2.9	2.8	3.2

(*) See glossary for definitions.

Sources: Central Bank of Chile and National Statistics Institute (INE).

FIGURE IV.1
Inflation indicators (1) (2)
(annual change, percent)

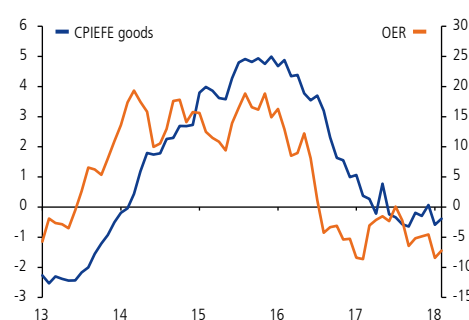


(1) See glossary for definitions.

(2) Starting in January 2014, calculations are based on the new indices with base year 2013=100, so they may not be strictly comparable with earlier figures.

Sources: Central Bank of Chile and National Statistics Institute (INE).

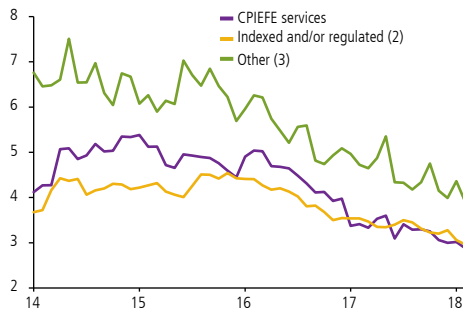
FIGURE IV.2
Exchange rate and CPIPE goods
(annual change, percent)



Sources: Central Bank of Chile and National Statistics Institute (INE).

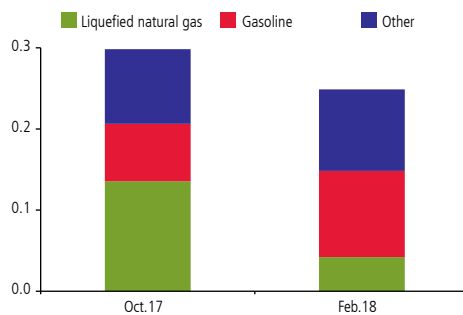


FIGURE IV.3
CPIEFE services: main components (1)
(annual change, percent)



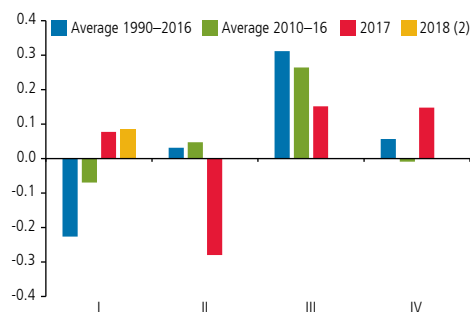
(1) For more details, see the March 2017 *Monetary Policy Report*, box IV.1.
(2) Excluding financial expenditures and transport items associated with this component.
(3) Excluding transport items associated with this component.
Sources: Central Bank of Chile and National Statistics Institute (INE).

FIGURE IV.4
Fuels: annual contribution to headline inflation
(percentage points)



Sources: Central Bank of Chile and National Statistics Institute (INE).

FIGURE IV.5
Fresh fruits and vegetables: quarterly contribution to headline inflation (1)
(percentage points)



(1) Calculated using the spliced series with baseline index 2013=100 and the fresh fruits and vegetables weights in the basket. Data are for the last month in each quarter.
(2) The first quarter includes data through February.
Sources: Central Bank of Chile and National Statistics Institute (INE).

RECENT EVOLUTION OF INFLATION

The annual CPIEFE inflation rate was 1.6% in February 2018 (1.9% in October), in line with the forecast and with the evolution of its main determinants. Taking a longer view, annual CPIEFE inflation has been gradually declining since early 2016, when it peaked at nearly 5%. This trend has been more marked in the goods component, where the annual inflation rate fell almost 5 percentage points, to -0.4% in February. This is largely due to the exchange rate trend. The peso-dollar exchange rate exceeded \$700 in January 2016 and has since appreciated, with some fluctuation, to around \$600 pesos to the dollar on the cutoff date of this *Report* (figure IV.2). In the same period, annual CPIEFE services inflation has declined more moderately (2 pp), to around 3% on the cutoff date. This reflects the lower sensitivity of services to the exchange rate, the evolution of the output gap, and the usual indexation (figure IV.3).

With regard to the more volatile items in the basket, annual energy inflation decreased from 4.1% in the last *Report* to 3.2% in February, largely due to lower oil price inflation of 5% (6.2% in October). The inflation trend of fuels is mainly related to lower growth of the domestic liquefied natural gas (LNG) price relative to a year ago (from 16 to 4.5% annually between October and February), which was not fully offset by the larger contribution of gasoline. While the international gasoline price increased over 10% annually, on average, from October to February, the appreciation of the peso-dollar exchange rate and the application of the fuel price stabilization mechanism (MEPCO) softened the pass-through to domestic prices (figure IV.4). Electricity tariffs have continued to record annual inflation rates of under 1% since October.

Annual food inflation increased to 2.8% in February (0.8% in October). Fresh fruits and vegetables recorded a sharp increase in the annual inflation rate, from -9.6% in October to 7% in February. This reflects the low basis of comparison and, to a lesser extent, an increase in the price level in recent months. Nevertheless, as was the case throughout much of 2017, fresh fruits and vegetables prices continue to follow a seasonal trend that differs from historical patterns. The contribution of these prices to headline inflation in the first two months of the year was positive, whereas they usually have a negative contribution in the first quarter (figure IV.5). In annual terms, potato and tomato prices continued to be quite volatile, growing almost 20% in February, after falling 20 and 30% annually, respectively, just a few months ago. For other foods, the annual inflation rate decreased to 1.9% in February (3.2% in October), one of the lowest rates of the past years.

The slowdown in the annual growth of nominal wages has intensified since late 2017 compared with previous months (figure IV.6). This is consistent with the February *Business Perceptions Report*, where interviewees cited lower wage expectations among job applicants and reported that raises were mainly based solely on the CPI adjustment. In more general terms, the interviewees indicated that cost control will continue to be a first-order concern in the coming months. Several people signaled that they expect to undertake investments as sales increase, and that these investments would largely focus on improving efficiency and reducing labor costs. With regard to imported costs, when asked about the effect of the recent exchange rate appreciation, the interviewees were divided as to whether this would translate into lower prices for consumers or a recovery of business margins.

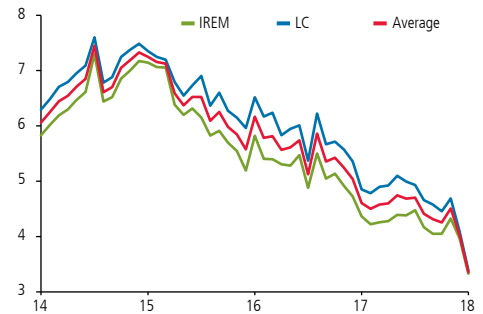
The cost of imported consumer goods (measured by the IVUM in dollars) rose almost 3% annually in the fourth quarter of 2017, with an ongoing recovery at the margin vis-à-vis the minimum levels that it had in 2016. The external price index (EPI) measured in dollars continued to grow at higher annual rates than in past months, reaching just under 8% in January (around 4% in October). This reflects the inflation recovery in the rest of the world and the multilateral depreciation of the U.S. dollar.

INFLATION OUTLOOK

In the baseline scenario, annual inflation will decline temporarily in the coming months and then hold around 2% through the first quarter of 2019. It will rise to 3% toward the end of that year. Annual CPIEFE variation will continue falling to about 1.5% in mid-2018, due mainly to the effects of the peso appreciation in recent months, and then rise gradually to 2% in the first quarter of 2019 and 3% by the end of the policy horizon. This projection is based on output growth above potential, which will lead to a closing of the output gap. Furthermore, as a working assumption, the baseline scenario estimates that the real exchange rate will return to its long-run value in two years.

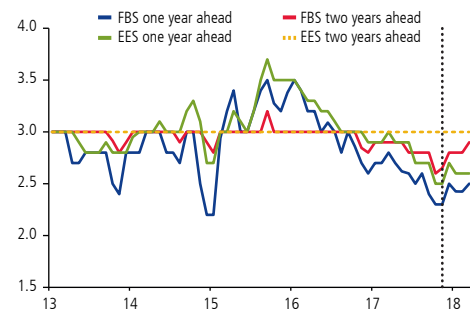
As mentioned, headline inflation will be somewhat below 2% in the short term. This reflects the fact that the CPIEFE will be around 1.5% annually, mainly because the aforementioned currency appreciation in recent months will generate more negative annual goods inflation rates. The more volatile items will partially offset this dynamic. In particular, food inflation will continue to rise, gradually approaching the historical average. Annual energy inflation, in the immediate term, is expected to remain around the level recorded on the cutoff date of this *Report*.

FIGURE IV.6
Nominal wages
(annual change, percent)



Sources: Central Bank of Chile and National Statistics Institute (INE).

FIGURE IV.7
Inflation expectations surveys (*)
(percent)



(*) The FBS is for the first half of each month through January 2018. As of February, the survey is published two working days after the publication of the minutes of the monetary policy meeting and three working days before the monetary policy meeting. The vertical dotted line marks the cutoff date of the *December Report*.

Source: Central Bank of Chile.



Market expectations one and two years ahead increased relative to the last *Report* (figure IV.7). Nevertheless, three months ahead, the market expects an additional decrease in inflation from the current levels. On the one hand, the market consensus continued to raise the economic growth forecast for 2018–2019; on the other, the peso appreciated relative to December. Thus, as of the cutoff date of this *Report*, inflation insurance points to annual inflation under 2% in the middle of this year. For December 2018, the March EES revised expected inflation to 2.6% (2.8% in October). One year ahead, the market expects a range of 2.4–2.6% as of the current cutoff date (2.2–2.5% in the December *Report*) according to inflation insurance and market surveys. Two years ahead, the March FBS raised its estimate to 2.9% (2.7% in the last *Report*); the March EES held steady at 3%; and expectations derived from financial asset prices (less premiums) rose to just under 3%.

BOX IV.1

EXCHANGE RATE PASS-THROUGH TO PRICES

The exchange rate is one of the main determinants of inflation, so there is a natural concern for understanding the sensitivity of inflation to fluctuations in the value of the currency, that is, the so-called exchange rate pass-through coefficient (PTC). Studies for Chile find that, on average, this coefficient is between 0.1 and 0.2 after one year^{1/}, although there is a lot of variation among the different products that make up the CPI basket^{2/}. Less studied are the differences in the PTC associated with the different underlying causes of currency fluctuation^{3/}. That is, how do the inflationary effects of exchange rate movements change when, for example, the movement originates in a change in the global value of the dollar versus an idiosyncratic shock in Chile?

This box contributes to the analysis of this issue^{4/}. In particular, the study assesses the PTC associated with two types of shocks that together explain nearly 90% of the fluctuations in the nominal exchange rate (NER): (i) changes in the international prices relevant for Chile^{5/}; and (ii) changes in interest rate parity conditions. In the former case, the idea is that a drop in external prices is typically associated with a more depreciated local currency, both through lower export prices and through the associated recovery of competitiveness. In the latter case, the transmission mechanism is known: increases in the premium demanded to invest in local currency generates a depreciation of the peso. The results show that the PTC differs markedly between the two cases: a 10% change in the NER is associated with an increase in inflation one year later of 0.5 and 2.6%, respectively. Furthermore, the inflationary effect of exchange rate movements associated with deviations in interest rate

parity is more persistent than the effect deriving from changes in external inflation. In fact after two years, the PTC is 0.6 and 5.4%, respectively. Finally, consistent with the above empirical evidence, in both cases exchange rate fluctuations are found to have a larger effect on tradable goods than on nontradables.

The monetary policy implication is evident: not all exchange rate movements have the same inflationary consequences, so the MPR response should take into account the underlying cause.

Pass-through coefficient by source of exchange rate movement

This analysis has three main results^{6/}. First, the dynamics of the nominal exchange rate are primarily explained by two shocks: changes in interest rate parity and changes in the external prices faced by the country. The former tends to capture factors specific to emerging economies, such as changes in risk appetite and shifts that are idiosyncratic to the country and that alter the attractiveness of investing in the local currency^{7/}. The latter is more associated with global supply and demand factors, as well as changes in the global value of the dollar. Taken together, these two shocks explain 90% of quarterly exchange rate fluctuations. The former accounts for nearly 20% of the variance and the latter around 70%. These shocks also explain 22% of the quarterly variance in inflation, 32% of the quarterly variance in CPIPE goods, and 19% of the quarterly variance in CPIPE services, where the last two are proxies for tradable and nontradable goods, respectively (table IV.2).

^{1/} That is, after twelve months, a 10% depreciation of the peso is associated with a 1–2% increase in inflation. See Albagli et al. (2015), Bertinatto and Saravia (2015), Contreras and Pinto (2016), and Justel and Sansone (2015).

^{2/} See the March 2016 *Monetary Policy Report*, box IV.1; and Contreras and Pinto (2016).

^{3/} One exception is Forbes et al. (2015).

^{4/} The different shocks that move the exchange rate are identified using a general equilibrium model for Chile developed by García-Cicco and García (2018). See the March 2016 *Monetary Policy Report*, box IV.1, for an alternative exercise exploring the differences in the inflationary effects of exchange rate movements deriving from global shocks versus shocks that are idiosyncratic to Chile.

^{5/} Specifically, it is the main component of a set of external prices, including both import and export prices. This shock is highly correlated with the copper price.

^{6/} See García-Cicco and García (2018) for details.

^{7/} This shock captures all the exchange rate movements that are not explained by the rate differential observed between Chilean peso-denominated bonds and U.S. bonds. Therefore, in principle, the shock captures a variety of elements that can explain deviations of the currency from the parity. Empirically, it is related with changes in future interest rate expectations that are not reflected in the variables observed by the model, such as shifts in the U.S. interest rate yield curve.



TABLE IV.2
Variance decomposition (*)
(percent)

Variable	International price shock	Interest rate parity shock	Other shocks
ΔNER	69	18	13
ΔCPI	6	15	79
ΔCPIEFE goods	9	23	68
ΔCPIEFE services	6	13	81

(*) Percent of the variance of each variable (rows) attributable to each shock (columns). Other shocks are the sum of all other shocks in the model.

Source: García et al. (2018).

Second, the results indicate that the PTC associated with these two different shocks diverges markedly. On the one hand, currency movements generated by an international price shock have a lesser impact than movements deriving from changes in interest rate parity conditions (table IV.3). The PTC associated with international price shocks explains just 6% of the historical variation in the CPI, despite being the dominant shock in nominal exchange rate fluctuations (table IV.2)^{8/}. On the other hand, the inflationary effects of an international price shock do not intensify over time, so the residual effect on inflation after two years—the monetary policy horizon—is small. In contrast, the inflationary effects of interest rate parity shocks increase over time (and are almost nine times greater on total CPI after two years), although the impact is more gradual. This makes it more significant for expected inflation.

TABLE IV.3
Estimated pass-through coefficients
(accumulated change in price per accumulated change in NER)

Variable	CPI	CPIEFE goods	CPIEFE services
	Conditional PTC, international price shock		
1 year	0.05	0.07	0.02
2 years	0.06	0.08	0.03
	Conditional PTC, interest rate parity shock		
1 year	0.26	0.40	0.09
2 years	0.54	0.75	0.29
	PTC, VAR model		
1 year	0.06	0.06	0.00
2 years	0.15	0.14	0.06

Sources: García et al. (2018) and Contreras and Pinto (2016).

Why the differences? Both shocks generate movements not only in the exchange rate, but also in other economic variables that lessen the inflationary impact of exchange rate fluctuations. In the short term, both an increase in the premium demanded for investing in Chilean pesos and a reduction in external prices generate a contraction in aggregate demand, which somewhat lessens the inflationary effect of the depreciation to a degree. However, in the case of lower international prices, there is an additional channel: import prices are also reduced, which puts downward pressure on inflation via lower imported goods prices. This stronger offsetting effect in the case of international price shocks explains the lower associated PTC. Finally, independently of the reason underlying the exchange rate movement, the PTC is always higher for tradable goods (CPIEFE goods) than for nontradables (CPIEFE services).

Conclusions

This box shows that there are non-trivial differences in the PTC depending on the origin of the exchange rate movement. Consequently, it is important to identify the cause of a given currency movement before assessing its effect on inflation and its implication for policy decisions. In particular, changes in international prices have a low impact on inflation in the medium term, despite being the dominant explanation for nominal exchange rate fluctuations. In this case, the MPR should not respond significantly to these fluctuations. In contrast, when the currency movement stems from a more idiosyncratic shock, such as a deviation in interest rate parity conditions, the inflationary impacts are greater and more persistent.

As usual, a couple of caveats are in order. First, the context in which exchange rate variations occur must always be taken into account, since shocks do not happen in isolation, but rather are accompanied by a number of simultaneous movements. It is the set of shocks that determines monetary policy, not a single given shock. Second, it is important to bear in mind that identifying the origin of a currency shock in real time is not trivial, and it may be revised over time.

^{8/} Weighting the PTC associated with each shock by its share in the variance of the currency depreciation delivers a similar average PTC to the estimated coefficient obtained using traditional empirical methodologies that do not control for the origin of the shock.

V. INFLATION SCENARIOS

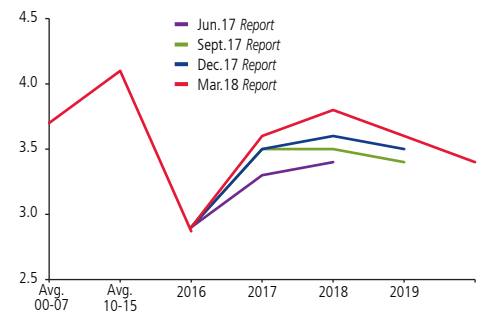
This chapter presents the Board's assessment on the Chilean economic outlook over the next two years. Projections of the most likely inflation and growth trajectories are included. As these trajectories are conditional on the assumptions in the baseline scenario, the Board's assessment of the risk balance for output and inflation is also provided.

BASELINE PROJECTION SCENARIO

Since the last *Report*, inflation has evolved in line with expectations, while output has been more dynamic than anticipated. The close of the 2017 national accounts showed that during the past year the economy grew 1.5%, as projected. However, it followed a somewhat different trajectory than previously considered, with greater weakness at the beginning of the year—that had begun in the second half of 2016—and greater strength towards the end of the year. With this, although the output gap early that year opened more than foreseen, this movement seems to have reversed quickly, so the Board's assessment of the current state of the gap does not change. Going forward, the exchange rate appreciation of recent months will result in inflation being below projections in the short term. Still, the faster growth in output will compensate this, by causing a somewhat faster closing of the output gap that will support the convergence of inflation over the policy horizon. In this context, the Board has kept the Monetary Policy Rate at 2.5% for some months and, in the baseline scenario, it estimates that the monetary stimulus will remain close to its current levels for now, and will begin to diminish as macroeconomic conditions consolidate the convergence of inflation to 3%. For the MPR this is a trajectory similar to what was deduced from the surveys available at the statistical cutoff of this *Report*.

The external scenario facing the Chilean economy has continued to improve in recent months. On the side of global growth, it is expected that business partners will expand somewhat more than foreseen in the previous *Report*. As was the trend throughout 2017, the known data revealed increasingly dynamic global activity. Thus, in 2017, our business partners grew by 0.7 percentage points over 2016 and 0.4 more than anticipated at the end of 2016. The better numbers have been observed across the various economies. Expectations for the projection horizon are that our trading partners will maintain an average growth rate that will outpace the average of the last five years (figure V.1). The corrections to the 2018 figures are particularly evident in

FIGURE V.1
Trading partners' growth
(annual change, percent)



Source: Central Bank of Chile.

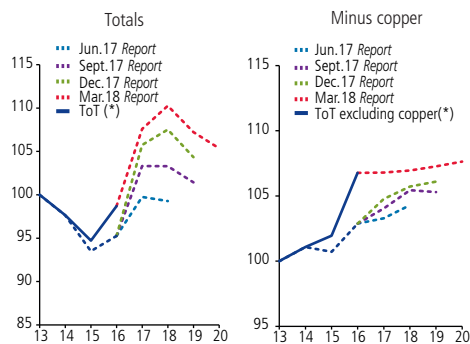


the projections of developed economies. In the Eurozone, where the dynamism of activity has surprised the most, the performance of the labor market and the recovery of confidence stand out, in a context where the region's exports have benefited from the improved international outlook. In the U.S., the effects that fiscal impulse measures will have on output must be considered. Thus, in both economies the average growth for 2018 is corrected upwards by 0.4 percentage points.

In the emerging world, as has been the trend in the last year, China's growth forecast is again revised upward in the projection horizon, with effects on output in the same direction that in other Asian economies. This, after actual Chinese indicators for 2017 exceeded forecasts. The Chinese authorities have succeeded in adopting policies that have allowed them to progress in rebalancing the economy, without causing any big damage to growth, and avoiding disruptions in the financial system. Thus, for the projection horizon it is expected that China's growth rates will gradually decrease, albeit more gradually than previously thought.

International financial conditions have remained favorable for emerging economies, despite some volatility in the past few months. Going forward, the improved performance of developed economies will lead their authorities to further withdraw their monetary packages. In the U.S., the market expectations implicit in financial asset prices point at the Federal Reserve raising the benchmark rate at least three times by 25 basis points in 2018. Based on recent history, this process is not expected to cause any significant disruptions in the financial markets, although it will result in higher external credit costs for emerging economies. The dollar has depreciated globally; however, the baseline scenario assumes an appreciation in the projection horizon, factoring in, among other elements, the effects that the U.S. fiscal policy and the announced protectionist measures will have on the dollar.

FIGURE V.2
Terms of trade
(index, 2013=100)



(*) Dark blue dotted line corresponds to the estimation of ToT for the 2013-2016 period, prior to the national accounts revision published on 19 March 2018.

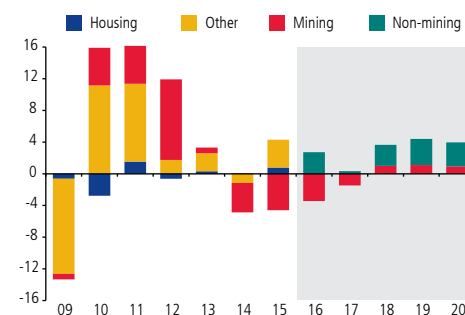
Source: Central Bank of Chile.

Higher terms of trade in the projection horizon are also part of the expected increase in the external impulse (figure V.2). The copper price has remained above US\$3 per pound. The better expectations for world growth, particularly the dynamism of the Chinese economy and the strength of global manufacturing output, lead to copper prices for 2018 and 2019 that are 3% and 7% higher than predicted in December, respectively. The baseline scenario also corrects upward the prices of other exports, including some agricultural products. This scenario is partially offset by oil prices that, despite being expected to average over 5% more than projected in December, continue to foresee a downward trajectory. This is so because of the limit imposed by the speed with which shale oil producers in the U.S. can enter and exit the market. Thus, the terms of trade are revised upwards for the coming years.

In 2017 the Chilean economy grew 1.5%, in line with the December forecasts. However, the review to the national accounts unveiled a quite weaker mining industry than in the first half and a more dynamic non-mining sector towards the end of the year. As a result, the basis for comparison dropped further due to the shutdown of *La Escondida* copper mining in early 2017. On the non-mining GDP side, the more favorable performance of sectors associated with investment towards the end of last year left a higher than expected starting point for non-mining GDP. All this will help to yield high annual growth rates in the first half of this year. The process of closing the output gap will resume towards the second half of 2018. Thus, in the baseline scenario, the Chilean economy will grow in 2018 between 3.0% and 4.0%, more than anticipated in the last *Report*. The stronger impulse from abroad and a monetary policy that will remain expansionary will support this process. As a working assumption, it is considered that in 2018 the economy will receive a fiscal impulse in line with the current budget. From then on, it is assumed that fiscal spending will follow the path of fiscal consolidation described in the last *Public Finance Report*. In 2019 and 2020—starting this *Report*, the Board has decided to add a third year to the projections, as a way to enhance transparency of its views on the economy and the trajectory for monetary policy—the economy will continue to grow above potential, thus closing the output gap. In 2019 GDP will grow in the 3.25% to 4.25% range and, in 2020, between 3.0% and 4.0%.

On the expenditure side, the year's closing of the national accounts revealed a not-so-negative situation than was foreseen for gross fixed capital formation (GFCF), with an annual change that went back to positive in the fourth quarter of 2017. It is worth noting that the construction and other works component strengthened a little, consistently with less negative figures in construction GDP and the better performance of some sectors, such as business services. Going forward, although expectations in the construction sector have recovered significantly, it is difficult to foresee a further acceleration in the immediate future. This, considering that several conjunctural indicators of the sector, such as employment or cement sales, have not improved further. Add to this that other sources of information such as the Capital Goods Corporation (CBC)'s Cadastral Survey, the investment plans of companies listed in the IPSA or the interviews conducted for the *Business Perceptions Report* have not pointed to an additional acceleration in the most recent past. In fact, this latter *Report* shows some caution, with a more marked dynamism being expected towards the second half of this year. In the baseline scenario, investment in machinery and equipment, a component that has already been showing better numbers, will continue to be supported by the low interest rates and exchange rate appreciation. Regarding mining investment, it is estimated that its adjustment cycle would come to an end during the year, reaping the effects of the higher copper price (figure V.3). Thus, as a ratio to GDP, in 2018 GFCF will reach 21.6 and 21.3% in real and nominal terms respectively, to increase slightly in 2019 and 2020.

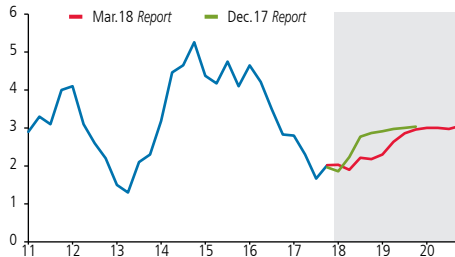
FIGURE V.3
Real annual contribution to GFCF (*)
(percentage points)



(*) For the year 2016 mining investment is estimated using FECU information. Housing investment uses household investment data taken from the national accounts by institutional sector; the other GFCF component is a residue. Reported projections for the years 2017, 2018 and 2019 as forecasting models of the Central Bank and sectoral sources, including the Capital Goods Corporation (CBC)'s investment plans and cadastral surveys.

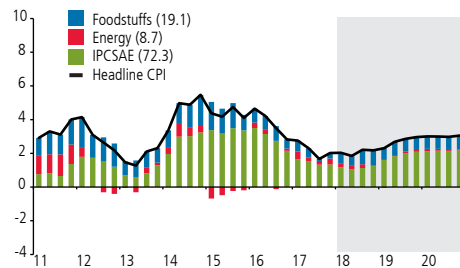
Source: Central Bank of Chile.

FIGURE V.4
CPI inflation forecast (*)
(annual change, percent)



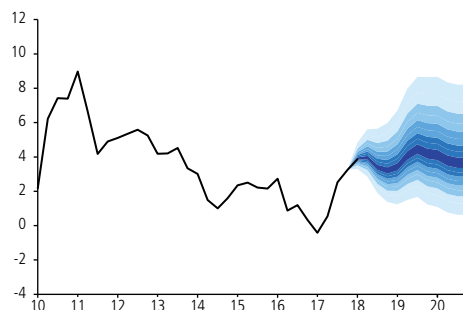
(*) Gray area, as from the first quarter of 2018, shows forecast.
Source: Central Bank of Chile.

FIGURE V.5
Contribution to annual CPI inflation (*)
(percentage points)



(*) Starting in January 2014, calculations are based on the new indices with base year 2013=100, so they may not be strictly comparable with earlier figures. Gray area, as from first quarter of 2018, shows forecast.
Sources: Central Bank of Chile and National Statistics Institute (INE).

FIGURE V.6
Quarterly GDP growth (*)
(annual change, percent)



(*) The figure shows the confidence interval of the baseline projection over the respective horizon (colored area). Confidence intervals of 10%, 30%, 50%, 70% and 90% around the baseline scenario are included. These intervals are calculated using the RMSE of the MAS-MEP models for the 2009-2017 average and summarize the risks on future growth as assessed by the Board. In the baseline scenario, the monetary stimulus will be held around its current levels and will begin to be lowered as macroeconomic conditions consolidate inflation's convergence to 3%.
Source: Central Bank of Chile.

Regarding consumption, the projections are somewhat higher than foreseen in December and in line with the expected recovery of income. Actually, growth is forecast of the real wage bill close to 4.5% in the 2018-2020 average, above the figures of around 3% in the two prior years. This, assuming that wages will again grow in line with the usual indexation clauses. Likewise, the projections of private consumption reflect the sustained recovery of consumer expectations as well as the strong dynamism shown by durables.

Exports will benefit from the stronger growth forecast for our trading partners, while imports will reflect the strengthening of domestic demand. The current account will post deficits of 1.5% and 2% of GDP in these years, up from 2017, in line with the increase in investment assumed in the new baseline scenario. At trend prices^{1/} the current account deficit changes to somewhat above 3% of GDP in the projection horizon.

Inflation has evolved in line with the December forecast but, going forward, the baseline scenario of this *Report* considers levels below projections, so the convergence of inflation to the 3% target is postponed until the second half of 2019 (figure V.4). This revision originates mainly in the appreciation experienced by the peso after the statistical closing of the previous *Report*. In any case, this *Report* considers that the RER will converge to its long-term values over the projection horizon. Thus, in the short term, annual CPI inflation will continue to fluctuate around 2% until the first quarter of 2019. Subsequently, to the extent that the RER returns to its long-term levels and the process of closing the gap is further consolidated, inflation will gradually converge to 3%, where it will stand at the close of the forecast horizon, the first quarter of 2020. The CPIEFE, whose goods component is more intensely affected by the exchange rate effect, will post annual variations somewhat below 1.5% in the coming months. By the second half of the year it will begin a steady rise, going past 2% at the turn of 2019 and approach 3% by the end of that year and into 2020 (figure V.5).

About monetary policy, the Board assumes in the baseline scenario that by 2020 the MPR will hover around its neutral level, which it continues to place between 4% and 4.5%. A working assumption is that the monetary stimulus will be held around its current levels and will begin to be lowered as macroeconomic conditions consolidate inflation's convergence to 3%. The MPR trajectory, meanwhile, is similar to what is deduced from the surveys available at the statistical cutoff of this *Report*.

^{1/} This measurement adjusts the value of mining exports and fuel imports considering the deviations of the prices of copper and oil from their long-term estimates. The same for rents and transfers associated with copper exports. The rest of exports and imports are valued using the current prices. It does not correct for possible changes in quantities exported or imported due to changes in the prices of copper or oil. The calculation uses long-term prices of US\$2.7 per pound of copper and US\$70 per barrel of oil (boxes V.2 in the September 2012 and December 2015 *Monetary Policy Reports*).

RISK SCENARIOS

As always, monetary policy conduct and possible adjustments to the policy rate will be conditional on the effects of incoming information on projected inflation dynamics (figures V.6, V.7, and V.8).

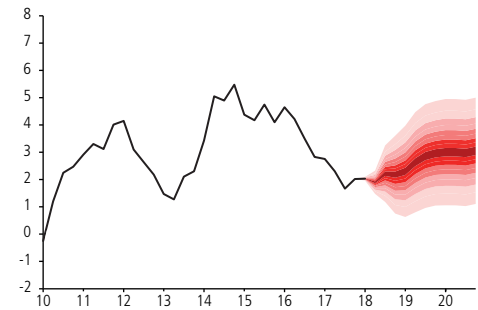
From the standpoint of its impact on the domestic economy, the risk balance in the external scenario has a downward bias. As a more positive scenario for global activity has materialized, the risks of a steeper Fed funds rate increase have risen. A faster inflation hike could force a faster withdrawal of the monetary stimulus. This could occur in a scenario of a more dynamic than expected demand, e.g., derived from the fiscal stimulus package being implemented. The resulting deterioration of global financial conditions could have particularly harsh consequences on those emerging economies whose fiscal or financial position is weaker or are highly indebted. China's situation is worrisome, as it has yet to solve a number of imbalances in its markets. Any pitfalls in this process could have significant effects on the prices of global financial assets and commodities.

Meanwhile, the U.S. government has made protectionist announcements that might lead to an escalation of responses in other countries, affecting world trade. Beyond the short-term consequences, this type of measures could have negative effects on the world economy's and Chile's trend growth.

Regarding the domestic economy, the Board estimates that the risks to activity have an upward bias. The outlook for 2018 shows investment growing in line with GDP. Still, it may show greater dynamism, considering the favorable external scenario, the expansionary monetary policy stance, the improved confidence indicators and data of recent months. This risk is tempered in part because the stagnant creation of private salaried employment and the lower dynamism of nominal wages are still cause for concern. In any case, various surveys show that expectations about employment have improved in recent months, in line with the improved growth outlook.

Regarding inflation, the Board estimates that the risks are unbiased. The threats to its convergence to 3% have diminished, mainly due to the implications that the better economic outlook has on the process of closing capacity gaps. However, the evolution of the exchange rate will cause inflation to be lower in the coming months than was expected in December, a situation that the Board will continue to monitor with special care, as it could have negative implications on the convergence of inflation to the target over the policy horizon. Accordingly, the Board reiterates its commitment to conduct monetary policy with flexibility, so that projected inflation stands at 3% over the two-year horizon.

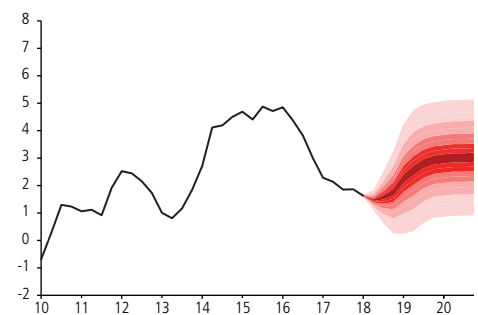
FIGURE V.7
CPI inflation forecast (*)
(annual change, percent)



(*) The figure shows the confidence interval of the baseline projection over the respective horizon (colored area). Confidence intervals of 10%, 30%, 50%, 70% and 90% around the baseline scenario are included. These intervals are calculated using the RMSE of the MAS-MEP models for the 2009-2017 average and summarize the risks on future inflation as assessed by the Board. In the baseline scenario, the monetary stimulus will be held around its current levels and will begin to be lowered as macroeconomic conditions consolidate inflation's convergence to 3%.

Source: Central Bank of Chile.

FIGURE V.8
CPIEFE inflation forecast (*)
(annual change, percent)



(*) The figure shows the confidence interval of the baseline projection over the respective horizon (colored area). Confidence intervals of 10%, 30%, 50%, 70% and 90% around the baseline scenario are included. These intervals are calculated using the RMSE of the MAS-MEP models for the 2009-2017 average and summarize the risks on future inflation as assessed by the Board. In the baseline scenario, the monetary stimulus will be held around its current levels and will begin to be lowered as macroeconomic conditions consolidate inflation's convergence to 3%.

Source: Central Bank of Chile.

**BOX V.1****THE BASELINE FORECASTS IN THE MONETARY POLICY REPORT**

The Central Bank carries out its monetary policy in an inflation-targeting framework, which, to work correctly, requires an adequate communication of the actions taken and the underlying justification, as well as an appropriate diagnosis of the evolution of the local and global economy. In this context, the quarterly *Monetary Policy Report* reveals the Board's view on the current state of the economy and its future outlook. The *Report* also conveys how monetary policy will be conducted under the most probable scenario, so as to ensure that the inflation forecast two years ahead is 3%, which is the Central Bank's target.

In each *Report*, the Board chooses an MPR path as a working assumption such that the baseline forecasts are consistent with inflation that not only hits the 3% target in two years, but also stays around that value thereafter. While this could always be inferred from the baseline forecasts, the Board previously did not explicitly communicate the baseline forecasts beyond the two year horizon.

Starting with this *Report*, to increase the transparency of its view of the economy and the monetary policy path, the Board has decided to add a third forecast year to the data published in each *Report*. This change complements the modification adopted in March 2016, when the Board extended the output growth forecast by a year^{1/}.

Thus, starting in March 2018, each *Report* will contain growth and inflation forecasts for three years—namely, the year in progress and the subsequent two years. The forecasts of these variables will continue to be reported in two ways. The first is as an estimated value in the baseline scenario, presented as a point estimate for inflation and a range estimate for growth^{2/}, following the current practice for the year in progress and the coming year (table V.1).

TABLE V.1

Growth estimate ranges in the *Monetary Policy Reports* (percentage points)

	Current year	Next year	Subsequent year
March	1.0	1.0	1.0
June	0.75	1.0	1.0
September	0.5	1.0	1.0
December	Point estimate	1.0	1.0

Source: Central Bank of Chile.

The second communication tactic is the use of fan charts (figures V.6, V.7, and V.8), which show the estimated quarterly path of annual CPI and CPlEFE inflation and of GDP growth, together with confidence intervals for the estimates. The illustration of the quarterly path of growth and inflation facilitates a better understanding of the dynamics implicit in the baseline scenario. The confidence intervals, in turn, highlight the uncertainty inherent in the estimates, on signaling that even in the presence of normal shocks, the variables can deviate significantly from the forecast. The bands may be symmetrical or asymmetrical, depending on the bias of the projection.

It is important to bear in mind that a correct reading of the forecasts published in the *Monetary Policy Reports* should take into account not only the point estimate for inflation or the range estimate for growth, but also the accompanying balance-of-risk assessment. The two are complements, not separate phenomena.

The expansion of the information set^{3/} initiated in this *Report* is on par with the standards of other central banks, and it will help improve understanding of the macroeconomic scenario and the probable course of monetary policy.

^{1/} *Monetary Policy Report*, March 2016, box V.1.

^{2/} For more details on the logic of using range and point estimates for growth and inflation, see the March 2016 *Monetary Policy Report*, box V.1.

^{3/} Including the publication of the Excel files for all the figures and tables included in the *Report*.

GLOSSARY

CDS: Credit default swap. A derivative instrument that provides insurance against the credit risk of the issuer of a given underlying sovereign or corporate bond. The premium implicit in the cost of this coverage (the CDS spread) is commonly used as an indicator of sovereign or corporate risk.

CEMBI: Corporate Emerging Market Bond Index. A corporate risk index maintained by JP Morgan. Measures the differential return on corporate bonds in dollars issued by banks and corporations in emerging economies, relative to U.S. Treasury bonds, which are considered risk-free.

Commodity exporters: Australia, Canada, and New Zealand.

CPIEFE: CPI excluding food and energy prices, leaving 72% of the total CPI basket.

EPI: External price index for Chile, calculated using the wholesale price index (WPI)—or the CPI if the WPI is not available—expressed in dollars, of the main trading partners included in the MER.

Growth of trading partners: The growth of Chile's main trading partners, weighted by their share in total exports over two moving years. The countries included are the destination for about 94% of total exports, on average, for the 1990–2016 period.

IVUM: Import price index.

Latin America: Argentina, Bolivia, Brazil, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, and Venezuela.

MER-X: MER excluding the U.S. dollar.

MER: Multilateral exchange rate. A measure of the nominal value of the peso against a broad basket of currencies, weighted as for the RER. For 2017, the following countries are included: Argentina, Belgium, Bolivia, Brazil, Canada, China, Colombia, France, Germany, India, Italy, Japan, Mexico, Netherlands, Paraguay, Peru, South Korea, Spain, Thailand, United Kingdom, and United States.

Output gap: A key indicator for measuring inflationary pressures, defined as the difference between the economy's actual output and its current production capacity in non-natural-resource sectors (non-mining GDP).

Potential GDP: The economy's current production capacity. Also called short-term potential GDP.



RER: Real exchange rate. A measure of the real value of the peso against a basket of currencies, which includes the same countries used to calculate the MER.

Rest of Asia: Hong Kong, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand.

Trend GDP: The medium-term growth potential of the Chilean economy, where the effect of shocks that usually alter production capacity in the short term have dissipated and the productive factors are thus used normally. In this context, growth depends on the structural characteristics of the economy and the average growth of productivity, variables that, in turn, determine the growth of productive factors.

World growth at market exchange rate: Each country is weighted according to its GDP in dollars, published in the IMF World Economic Outlook (WEO, October 2017). The sample of countries used in the calculation represent around 90% of world growth. For the remaining 10%, average growth is estimated at 2% for the 2018–2020 period.

World growth: Regional growth weighted by its share in world GDP at PPP, published in the IMF World Economic Outlook (WEO, October 2017). World growth forecasts for the period 2018–2020 are calculated from a sample of countries that represent about 86% of world GDP. For the remaining 14%, average growth is estimated at 3.6% for the period.

ABBREVIATIONS

BCP: Central Bank bonds denominated in pesos

BCU: Indexed Central Bank bonds denominated in UFs

BLS: Bank Lending Survey

BPR: Business Perceptions Report

CPIEFE: Consumer price index excluding food and energy

EES: Economic Expectations Survey

FBS: Financial Brokers Survey

IMCE: Monthly Business Confidence Index

IPEC: Consumer Confidence Index

LCI: Labor cost index

MPR: Monetary policy rate

SNA: System of National Accounts

UF: *Unidad de Fomento* (an inflation-indexed unit of account).

REFERENCES

- Adler, G., and C. Tovar. 2014. "Intervenciones en el mercado cambiario y su efecto en el tipo de cambio," *Monetaria* 0(1): 1–54. Centro de Estudios Monetarios Latinoamericanos.
- Albagli, E., L. Ceballos, S. Claro, and D. Romero. 2018. "Channels of U.S. Monetary Policy Spillovers into International Bond Markets." Mimeo. Central Bank of Chile.
- Albagli, E., A. Naudon, and R. Vergara. 2015. "Inflation Dynamics in LATAM: A Comparison with Global Trends and Implications for Monetary Policy." Economic Policy Paper 58. Central Bank of Chile.
- Barclays Capital. 2018. *Global Economics Weekly*. Several issues.
- Bertinatto, L., and D. Saravia. 2015. "El rol de asimetrías en el pass-through: evidencia para Chile." Working Paper 750. Central Bank of Chile.
- Blanchard, O., G. Adler, and I. de Carvalho Filho. 2015. "Can Foreign Exchange Intervention Stem Exchange Rate Pressures from Global Capital Flow Shocks?" NBER Working Paper 21427. National Bureau of Economic Research.
- Brandt, N., P. Schreyer, and V. Zipperer. 2017. "Productivity Measurement with Natural Capital." *Review of Income and Wealth* 63(S1): S7–S21.
- Caselli, F., and J. Feyrer. 2007. "The Marginal Product of Capital." *Quarterly Journal of Economics* 22(2): 535–68.
- Central Bank of Chile. 2018. *Informe de Percepciones de Negocios*. February.
- Central Bank of Chile. *Monetary Policy Report*. Several issues.
- Comisión Chilena del Cobre and Comisión Nacional de Productividad. 2016. "Productividad en la gran minería del cobre en Chile, período 2000/2014." Working Paper 2. Santiago.
- Comisión Nacional de Productividad. 2017. "Productividad de la gran minería del cobre." Santiago.
- Committee for a Responsible Federal Budget. 2018. *Updating the U.S. Budget Outlook* (www.crfb.org/papers/updating-us-budget-outlook).
- Consensus Forecasts. *A Digest of International Forecast*. Several issues.
- Contreras, G., and F. Pinto. 2016. "Traspaso de tipo de cambio nominal a inflación desagregada en Chile." *Economía Chilena* 19: 154–70.
- Corbo V., and R. Gonzalez. 2014. "Productivity and Economic Growth in Chile." In *Growth Opportunities for Chile*, edited by V. Corbo. Santiago: CEP.
- CRU. 2018. *Copper Market Outlook*. March.
- Daude, C., E. Levy Yeyati, and A. Nagengast. 2016. "On the Effectiveness of Exchange Rate Interventions in Emerging Markets." *Journal of International Money and Finance* 64(C): 239–61.
- De La Huerta, C., and J. Luttini. 2018. "Implications of Exhaustible Resources for Growth Accounting." Mimeo. Central Bank of Chile.
- Deutsche Bank. 2018. *Macro Forecast Weekly Update*.
- Emerging Portfolio Fund Research. 2018. *Global Fund Allocations* (www.epfr.com/).
- Food and Agriculture Organization. 2018. *FAOSTAT* (faostat.fao.org/).



- Forbes, K., I. Hjortsoe, and T. Nenova. 2015. "The Shocks Matter: Improving Our Estimates of Exchange Rate Pass-Through." Discussion Paper 43. Bank of England, Monetary Policy Committee Unit.
- Fratzscher, M., O. Gloede, L. Menkhoff, L. Sarno, and T. Stöhr. 2017. "When Is Foreign Exchange Intervention Effective? Evidence from 33 Countries." CEPR Discussion Paper 12510. Centre for Economic Policy Research.
- García, B., M. García, and J. García-Cicco, 2018. "Traspaso del tipo de cambio a precios en Chile: un análisis estructural." Mimeo. Central Bank of Chile.
- García, M., and J. García-Cicco, 2018, "Revisiting the Exchange-Rate Pass-Through: A General Equilibrium Perspective." Mimeo. Central Bank of Chile.
- Ghosh, A., J. Ostry, and M. Qureshi. 2017. "Managing the Tide: How Do Emerging Markets Respond to Capital Flows?" IMF Working Paper 17/69. International Monetary Fund.
- International Energy Agency. 2018. Oil Market Report.
- International Monetary Fund. 2017. World Economic Outlook. October.
- International Monetary Fund. 2018. World Economic Outlook Update. January.
- Joint Committee on Taxation. 2017a. Estimated Budget of the Conference Agreement for H.R.1, The "Tax Cuts and Jobs Act" (www.jct.gov/publications.html?func=startdown&id=5053).
- Joint Committee on Taxation. 2017b. Macroeconomic Analysis of the Conference Agreement for H.R. 1, the "Tax Cuts and Jobs Act" (www.jct.gov/publications.html?func=startdown&id=5055).
- JP Morgan Chase. 2018. Global Data Watch. March.
- Justel, S., and A. Sansone. 2015. "Exchange Rate Pass-Through to Prices: VAR Evidence for Chile." Working Paper 747. Central Bank of Chile.
- Magendzo I., and M. Villena. 2016. "Evolución de la productividad total de factores en Chile." Mimeo. CORFO-UAI.
- Monge-Naranjo, A., J. Sanchez, and R. Santaefalicia-Llopis. 2015. "Natural Resources and Global Misallocation." Working Paper 2015-13. Federal Reserve Bank of St. Louis.
- Nordhaus W. 1992. "Lethal Model 2: The Limits to Growth Revisited." Brookings Papers on Economic Activity 23: 1–60. Brookings Institute.
- Obstfeld, M, J. Ostry, and M. Qureshi. 2018. "A Tie That Binds: Revisiting the Trilemma in Emerging Market Economies." Review of Economics and Statistics (forthcoming).
- Rey, H. 2016. "International Channels of Transmission of Monetary Policy and the Mundellian Trilemma." IMF Economic Review 64(1): 6–35. International Monetary Fund.
- U.S. Congressional Budget Office. 2018. Bipartisan Budget Act of 2018 (www.cbo.gov/system/files/115th-congress-2017-2018/costestimate/bipartisanbudgetactof2018.pdf).
- U.S. Office of Management and Budget. 2018. "An American Budget: Fiscal Year 2019." Budget of the U.S. Government (www.whitehouse.gov/wp-content/uploads/2018/02/budget-fy2019.pdf).

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