

assess sensitivity (e.g., 1 percent, 10 percent, etc.) are included to allow users of the Annual Report to understand a general direction cause and effect of changes in the estimates and do not represent management's predictions of variability. For all of these estimates, it should be noted that future events rarely develop exactly as forecasted, and estimates require regular review and adjustment.

Pension Assumptions

For our defined benefit pension plans, the measurement of the benefit obligation to plan participants and net periodic pension (income)/cost requires the use of certain assumptions, including, among others, estimates of discount rates and expected return on plan assets.

Changes in the discount rate assumptions would impact the (gain)/loss amortization and interest cost components of the net periodic pension (income)/cost calculation and the projected benefit obligation (PBO). The discount rate assumption for the IBM Personal Pension Plan (PPP), a U.S.-based defined benefit plan, decreased by 100 basis points to 3.10 percent on December 31, 2019. This change will increase pre-tax income recognized in 2020 by an estimated \$31 million. If the discount rate assumption for the PPP had increased by 100 basis points on December 31, 2019, pre-tax income recognized in 2020 would decrease by an estimated \$16 million. Further changes in the discount rate assumptions would impact the PBO which, in turn, may impact our funding decisions if the PBO exceeds plan assets. A 25 basis point increase or decrease in the discount rate would cause a corresponding decrease or increase, respectively, in the PPP's PBO of an estimated \$1.2 billion based upon December 31, 2019 data.

The expected long-term return on plan assets assumption is used in calculating the net periodic pension (income)/cost. Expected returns on plan assets are calculated based on the market-related value of plan assets, which recognizes changes in the fair value of plan assets systematically over a five-year period in the expected return on plan assets line in net periodic pension (income)/cost. The differences between the actual return on plan assets and the expected long-term return on plan assets are recognized over five years in the expected return on plan assets line in net periodic pension (income)/cost and also as a component of actuarial (gains)/losses, which are recognized over the service lives or life expectancy of the participants, depending on the plan, provided such amounts exceed thresholds which are based upon the benefit obligation or the value of plan assets, as provided by accounting standards.

To the extent the outlook for long-term returns changes such that management changes its expected long-term return on plan assets assumption, each 50 basis point increase or decrease in the expected long-term return on PPP plan assets assumption would have an estimated decrease or increase, respectively, of \$241 million on the following year's pre-tax net periodic pension (income)/cost (based upon the PPP's plan assets at December 31, 2019 and assuming no contributions are made in 2020).

We may voluntarily make contributions or be required, by law, to make contributions to our pension plans. Actual results that differ from the estimates may result in more or less future IBM funding into the pension plans than is planned by management. Impacts of these types of changes on our pension plans in other countries worldwide would vary depending upon the status of each respective plan.

In addition to the above, we evaluate other pension assumptions involving demographic factors, such as retirement age and mortality, and update these assumptions to reflect experience and expectations for the future. Actual results in any given year can differ from actuarial assumptions because of economic and other factors.

For additional information on our pension plans and the development of these assumptions, see note V, "Retirement-Related Benefits."

Revenue Recognition

Application of GAAP related to the measurement and recognition of revenue requires us to make judgments and estimates. Specifically, complex arrangements with nonstandard terms and conditions may require significant contract interpretation to determine the appropriate accounting, including whether promised goods and services specified in an arrangement are distinct performance obligations. Other significant judgments include determining whether IBM or a reseller is acting as the principal in a transaction and whether separate contracts should be combined and considered part of one arrangement.

Revenue recognition is also impacted by our ability to determine when a contract is probable of collection and to estimate variable consideration, including, for example, rebates, volume discounts, service-level penalties, and performance bonuses. We consider various factors when making these judgments, including a review of specific transactions, historical experience and market and economic conditions. Evaluations are conducted each quarter to assess the adequacy of the estimates. If the estimates were changed by 10 percent in 2019, the impact on net income would have been immaterial.

Costs to Complete Service Contracts

We enter into numerous service contracts through our services businesses. During the contractual period, revenue, cost and profits may be impacted by estimates of the ultimate profitability of each contract, especially contracts for which we use cost-to-cost measures of progress. If at any time these estimates indicate the contract will be unprofitable, the entire estimated loss for the remainder of the contract is recorded immediately in cost. We perform ongoing profitability analyses of these services contracts in order to determine whether the latest estimates require updating. Key factors reviewed to estimate the future costs to complete each contract are future labor costs and product costs and expected productivity efficiencies. Contract loss provisions recorded as a component of other accrued expenses and liabilities were immaterial at December 31, 2019 and 2018.

Income Taxes

We are subject to income taxes in the U.S. and numerous foreign jurisdictions. Significant judgments are required in determining the consolidated provision for income taxes.

During the ordinary course of business, there are many transactions and calculations for which the ultimate tax determination is uncertain. As a result, we recognize tax liabilities based on estimates of whether additional taxes and interest will be due. These tax liabilities are recognized when, despite our belief that our tax return positions are supportable, we believe that certain positions may not be fully sustained upon review by tax authorities. We believe that our accruals for tax liabilities are