

RSUs, PSUs, employee SARs and stock options activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for employee SARs and stock options, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes JPMorgan Chase's RSUs, PSUs, employee SARs and stock options activity for 2019.

Year ended December 31, 2019 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs		SARs/Options			
	Number of units	Weighted-average grant date fair value	Number of awards	Weighted-average exercise price	Weighted-average remaining contractual life (in years)	Aggregate intrinsic value
Outstanding, January 1	58,809	\$ 85.04	12,463	\$ 41.46		
Granted	23,811	99.79	18	111.01		
Exercised or vested	(28,754)	69.98	(6,923)	41.50		
Forfeited	(1,627)	98.58	—	—		
Canceled	NA	NA	(31)	89.71		
Outstanding, December 31	52,239	\$ 99.62	5,527	\$ 41.36	1.9	\$ 539,071
Exercisable, December 31	NA	NA	5,522	41.29	1.9	538,971

The total fair value of RSUs that vested during the years ended December 31, 2019, 2018 and 2017, was \$2.9 billion, \$3.6 billion and \$2.9 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2019, 2018 and 2017, was \$503 million, \$370 million and \$651 million, respectively.

Compensation expense

The Firm recognized the following noncash compensation expense related to its various employee share-based incentive plans in its Consolidated statements of income.

Year ended December 31, (in millions)	2019	2018	2017
Cost of prior grants of RSUs, PSUs, SARs and employee stock options that are amortized over their applicable vesting periods	\$ 1,141	\$ 1,241	\$ 1,125
Accrual of estimated costs of share-based awards to be granted in future periods including those to full-career eligible employees	1,115	1,081	945
Total noncash compensation expense related to employee share-based incentive plans	\$ 2,256	\$ 2,322	\$ 2,070

Tax benefits

Excess tax benefits (including tax benefits from dividends or dividend equivalents) on share-based payment awards are recognized within income tax expense in the Consolidated statements of income. Income tax benefits related to share-based incentive arrangements recognized in the Firm's Consolidated statements of income for the years ended December 31, 2019, 2018 and 2017, were \$895 million, \$1.1 billion and \$1.0 billion, respectively.

At December 31, 2019, approximately \$693 million (pretax) of compensation expense related to unvested awards had not yet been charged to net income. That cost is expected to be amortized into compensation expense over a weighted-average period of 1.6 years. The Firm does not capitalize any compensation expense related to share-based compensation awards to employees.