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By location of shipment, in 2019, revenues grew 6.8% in Americas, driven by Power Discrete, remained substantially flat in Asia and decreased 8.6% in EMEA, mainly due to lower sales of Microcontrollers and Power Discrete. In 2018 revenues grew across all regions, led by Asia Pacific and EMEA, mainly due to growth in Imaging and Automotive.

Gross profit

	Year Ended December 31,			Variation	
	2019	2018	2017	2019 vs 2018	2018 vs 2017
	(In millions)				
Cost of sales	\$ (5,860)	\$ (5,803)	\$ (5,075)	1.0%	(14.3)%
Gross profit	\$ 3,696	\$ 3,861	\$ 3,272	(4.3)%	18.0%
Gross margin (as percentage of net revenues)	38.7%	40.0%	39.2%	-130 bps	+80 bps

In 2019, gross margin decreased by 130 basis points to 38.7% from 40.0% in the full year 2018 mainly due to normal price pressure and increased unsaturation charges, partially offset by improved manufacturing efficiencies, better product mix, and favorable currency effects, net of hedging. Unused capacity charges in 2019 were \$65 million, impacting full year gross margin by 70 basis points.

In 2018, gross margin improved by 80 basis points to 40.0% from 39.2% in the full year 2017 benefiting from manufacturing efficiencies and better product mix, partially offset by normal price pressure and unfavorable currency effects, net of hedging. In 2018 unused capacity charges were negligible.

Operating expenses

	Year Ended December 31,			Variation	
	2019	2018	2017	2019 vs 2018	2018 vs 2017
	(In millions)				
Selling, general and administrative expenses	\$(1,093)	\$(1,095)	\$ (981)	0.3%	(11.7)%
Research and development expenses	(1,498)	(1,398)	(1,296)	(7.1)	(7.9)
Total operating expenses	\$(2,591)	\$(2,493)	\$(2,277)	(3.9)%	(9.5)%
As percentage of net revenues	(27.1)%	(25.8)%	(27.3)%	-130 bps	+150 bps

The 2019 operating expenses increased 3.9% compared to the prior year, mainly due to salary dynamic, increased spending in certain R&D programs and higher share-based compensation cost, partially offset by favorable currency effects, net of hedging.

The 2018 operating expenses increased 9.5% compared to the prior year, mainly due to unfavorable currency effects, net of hedging, salary dynamic, increased R&D activities and higher costs of the share-based compensation plans.

The R&D expenses were net of research tax credits in France and Italy, which amounted to \$126 million in 2019, \$138 million in 2018 and \$124 million in 2017.

Other income and expenses, net

	Year Ended December 31,		
	2019	2018	2017
	(In millions)		
Research and development funding	\$ 132	\$ 52	\$ 65
Phase-out and start-up costs	(38)	(1)	(8)
Exchange gain (loss), net	—	4	4
Patent costs	(1)	(8)	(9)
Gain on sale of businesses and non-current assets	7	8	4
Other, net	3	(2)	(1)
Other income and expenses, net	\$ 103	\$ 53	\$ 55
As percentage of net revenues	1.1%	0.5%	0.7%