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In the fourth quarter of 2019, we recognized other income, net of expenses, of \$54 million, increasing from a negative \$2 million in the prior quarter and from an income of \$16 million in the year-ago quarter, reflecting higher R&D grants in Italy associated with the IPCEI program.

Impairment, restructuring charges and other related closure costs

	Three Months Ended		
	December 31, 2019	September 29, 2019	December 31, 2018
	(Unaudited, in millions)		
Impairment, restructuring charges and other related closure costs	\$ (3)	\$ —	\$ (2)

In the fourth quarter of 2019, we recorded \$3 million of impairment, restructuring charges and other related closure costs, primarily consisting of impairment of licenses dedicated exclusively to certain development projects that were cancelled, while no alternative future use.

In the third quarter of 2019, we did not record any impairment, restructuring charges and other related closure costs.

In the fourth quarter of 2018, we recorded \$2 million of impairment, restructuring charges and other related closure costs, related to the impairment of acquired technologies, for which it was determined that they had no future alternative use.

Operating income

	Three Months Ended		
	December 31, 2019	September 29, 2019	December 31, 2018
	(Unaudited, in millions)		
Operating income	\$ 460	\$ 336	\$ 443
As percentage of net revenues	16.7%	13.1%	16.8%

Operating income in the fourth quarter grew on a sequential and year-over-year basis to \$460 million compared to \$336 million and \$443 million in the prior and year-ago quarters, respectively.

Operating income by product group

	Three Months Ended					
	December 31, 2019		September 29, 2019		December 31, 2018	
	\$ million	% of net revenues	\$ million	% of net revenues	\$ million	% of net revenues
	(Unaudited)					
Automotive and Discrete Group (ADG)	\$ 113	12.2%	\$ 76	8.5%	\$ 141	14.6%
Analog, MEMS and Sensors Group (AMS)	281	25.9	198	20.5	202	20.5
Microcontrollers and Digital ICs Group (MDG)	119	16.0	108	15.7	122	17.7
Total operating income of product segments	513	18.6	382	15.0	465	17.6
Others ⁽¹⁾	(53)	—	(46)	—	(22)	—
Total operating income	\$ 460	16.7%	\$ 336	13.1%	\$ 443	16.8%

- (1) Operating results of "Others" include items such as unused capacity charges, impairment and restructuring charges and other related closure costs, management reorganization expenses, phase out and start-up costs, and other unallocated expenses such as strategic or special research and development programs, certain corporate-level operating expenses, patent claims and litigations, and other costs that are not allocated to product groups, as well as assembly services and other revenue.