S3 Table. Univariate and multivariate analyses with respect to overall survival in all subjects.

| Characteristic | Univariate analysis | | | Multivariate analysis | | | | | | | | |
| | | | | Biological model[a] | | | Treatment model[b] | | | Combined model[c] | | |
	Hazard ratio	95% CI	p-value	Hazard ratio	95% CI	p-value	Hazard ratio	95% CI	p-value	Hazard ratio	95% CI	p-value
Education level (high vs. low)	0.677	0.643-0.712	< 0.001	0.869	0.798-0.945	< 0.001	0.794	0.743-0.849	< 0.001	0.974	0.878-1.082	0.625
Age (> 50 vs. ≤ 50)	1.502	1.428-1.581	< 0.001	1.350	1.242-1.467	< 0.001	-	-	-	1.282	1.158-1.419	< 0.001
Tumor size (> 2 cm vs. ≤ 2 cm)	2.631	2.490-2.780	< 0.001	1.921	1.718-2.149	< 0.001	-	-	-	1.571	1.362-1.812	< 0.001
Node positivity (yes vs. no)	3.038	2.881-3.204	< 0.001	2.393	2.145-2.669	< 0.001	-	-	-	2.017	1.745-2.331	< 0.001
Stage (II, III vs. I)	3.288	3.073-3.518	< 0.001	0.865	0.731-1.024	0.091	-	-	-	1.007	0.811-1.250	0.951
Hormone receptor (positive vs. negative)	0.563	0.533-0.594	< 0.001	0.584	0.538-0.635	< 0.001	-	-	-	0.645	0.552-0.754	< 0.001
HER2 (positive vs. negative)	1.328	1.242-1.419	< 0.001	0.984	0.905-1.070	0.706	-	-	-	0.828	0.747-0.918	< 0.001
Histologic grade (3 vs. 1, 2)	1.896	1.792-2.006	< 0.001	1.436	1.323-1.559	< 0.001	-	-	-	1.464	1.323-1.620	< 0.001
Lymphovascular invasion (yes vs. no)	2.360	2.216-2.514	< 0.001	1.557	1.433-1.692	< 0.001	-	-	-	1.532	1.380-1.701	< 0.001
Body mass index (> 25 vs. ≤ 25)	1.246	1.181-1.315	< 0.001	1.023	0.944-1.109	0.581	-	-	-	1.061	0.962-1.171	0.234
Operation period			< 0.001						< 0.001			< 0.001
1987-2005	Reference			-			Reference			Reference		
2006-2010	0.735	0.693-0.778	< 0.001	-	-	-	0.846	0.786-0.910	< 0.001	0.882	0.797-0.977	0.016
2011-2014	0.541	0.480-0.608	< 0.001	-	-	-	0.627	0.542-0.727	< 0.001	0.629	0.522-0.758	< 0.001
Operation, mastectomy vs lumpectomy	2.448	2.312-2.592	< 0.001	-	-	-	3.915	3.627-4.226	< 0.001	2.247	2.001-2.524	< 0.001
Radiation therapy, yes vs no	0.863	0.817-0.912	< 0.001	-	-	-	2.533	2.300-2.791	< 0.001	1.703	1.479-1.961	< 0.001
Chemotherapy, yes vs no	1.556	1.449-1.672	< 0.001	-	-	-	1.300	1.170-1.445	< 0.001	0.746	0.625-0.890	0.001
Hormonal therapy, yes vs no	0.564	0.529-0.601	< 0.001	-	-	-	0.577	0.534-0.623	< 0.001	0.745	0.635-0.874	< 0.001

Values are presented as number (%). Three models including the biological model, treatment model, and combined model were used for multivariate analyses. HR, hazard ratio; CI, confidence interval; HER2, human epidermal growth factor receptor 2. [a]Education level was adjusted with eight factors including tumor size, node positivity, stage, hormonal receptor, HER2, histologic grade, lymphovascular invasion, and body mass index, [b]Education level was adjusted with five factors including operation time, operation, radiation therapy, chemotherapy and hormonal therapy, [c]Education level was adjusted with all thirteen factors described above.