Table 1 **Size of the graph for TIF, ATIF, BDDF$_r$, and BDDF**

		TIF			ATIF			BDDF$_r$			BDDF
n	m	*avg size*	*max size*	*avg red*	*avg size*	*max size*	*avg red*	*avg size*	*max size*	*avg red*	*avg red*
40	2	40,429.9	48,853	78.1%	790,466.9	954,703	88.7%	126,406.3	171,440	86.1%	85.6%
40	4	21,178.7	25,133	87.4%	395,336.0	467,850	91.2%	71,374.4	88,404	90.1%	89.4%
50	2	63,730.8	73,205	80.4%	1,564,008.6	1,796,148	90.4%	199,107.5	257,220	84.5%	84.2%
50	4	33,066.8	37,605	85.7%	781,463.4	887,636	91.2%	111,098.7	131,976	88.7%	88.2%
100	2	257,888.0	294,297	76.6%	12,770,654.5	14,572,902	90.5%	813,603.8	1,049,008	83.7%	83.4%
100	4	131,364.0	149,197	83.2%	6,379,927.2	7,243,901	91.9%	448,032.2	536,716	85.1%	84.8%

Table 2 **Computation time (in seconds) and number of instances solved at the root for the LP relaxation of TIF and ATIF**

		TIF			ATIF		
n	m	*avg time*	*max time*	*# opt*	*avg time*	*max time*	*# opt*
40	2	0.59	1.16	6	2.16	4.09	7
40	4	0.31	0.67	8	0.82	1.50	10
50	2	1.12	3.13	6	5.23	12.34	7
50	4	0.63	1.42	7	1.90	3.69	8
100	2	14.43	35.17	4	90.42	183.96	4
100	4	7.29	16.22	6	26.71	51.46	6

Table 3 **Computation time (in seconds) and number of instances solved at the root for the LP relaxation of BDDF$_r$ and BDDF**

		BDDF$_r$			BDDF		
n	m	*avg time*	*max time*	*# opt*	*avg time*	*max time*	*# opt*
40	2	1.39	2.79	9	1.80	3.89	8
40	4	0.67	1.38	9	0.87	1.77	8
50	2	2.57	3.84	8	3.25	5.83	8
50	4	1.29	2.62	8	1.70	3.52	8
100	2	27.26	52.14	6	36.18	60.49	6
100	4	12.01	20.46	6	15.58	25.21	6

Table 4 **Average and maxium gap from the starting solution for the formulations TIF, ATIF, BDDF$_r$, and BDDF**

		TIF		ATIF		BDDF$_r$		BDDF	
n	m	*avg*	*max*	*avg*	*max*	*avg*	*max*	*avg*	*max*
40	2	1.78%	26.61%	1.73%	26.61%	1.49%	26.61%	1.53%	27.05%
40	4	0.56%	5.03%	0.46%	3.68%	0.49%	4.44%	0.53%	4.83%
50	2	0.62%	4.25%	0.57%	4.25%	0.58%	4.25%	0.59%	4.25%
50	4	0.54%	5.95%	0.51%	5.95%	0.51%	5.95%	0.52%	5.95%
100	2	2.27%	35.29%	1.62%	21.05%	0.79%	14.79%	0.83%	15.82%
100	4	0.54%	8.62%	0.52%	8.62%	0.53%	8.62%	0.53%	8.62%