

	Variable	%
Model 1	<i>medium_deposit_denied_day_num_ratio</i>	100
	<i>small_deposit_approved_sum_mean</i>	98.44
	<i>result_cash_sum_sd</i>	92.43
	<i>small_turnover_cash_sum_mean</i>	90.07
	<i>small_turnover_cash_casino_live_sum_ratio</i>	89.07
Model 2A	<i>small_limit_deposit_increase_num_mean</i>	100
	<i>country_code_num_5</i>	93.88
	<i>country_code_num_8</i>	89.51
	<i>small_session_sum_mean</i>	87.88
	<i>country_code_num_9</i>	87.52
Model 2B	<i>session_sum_sd</i>	100
	<i>small_session_sum_mean</i>	95.93
	<i>small_deposit_approved_sum_mean</i>	95.12
	<i>deposit_approved_num_sd</i>	90.38
	<i>bonus_convert_day_num_ratio</i>	89.37

Table 1: The five most important variables for each of the three models in the two-stage binary ANN approach.

Variable	%
<i>date_delta</i>	100.00
<i>country_code_num_8</i>	86.04
<i>country_code_num_4</i>	85.96
<i>deposit_approved_sum_mean</i>	81.53
<i>country_code_num_3</i>	81.03
<i>balance_cash_sum</i>	77.49
<i>small_session_num_mean</i>	70.49
<i>country_code_num_6</i>	70.19
<i>bonus_convert_day_num_ratio</i>	69.27
<i>bonus_convert_num_mean</i>	68.64
<i>country_code_num_9</i>	66.80
<i>limit_deposit_increase_num_mean</i>	66.42
<i>medium_limit_deposit_decrease_day_num_ratio</i>	66.00
<i>small_turnover_cash_sum_mean</i>	65.57
<i>deposit_denied_num_sd</i>	64.91
<i>turnover_cash_sports_sum_ratio</i>	64.78
<i>country_code_num_5</i>	64.67
<i>medium_session_num_mean</i>	64.63
<i>exclusion_delta</i>	63.85
<i>small_limit_deposit_decrease_day_num_ratio</i>	63.71
<i>medium_deposit_approved_sum_mean</i>	63.44
<i>small_deposit_approved_sum_mean</i>	62.90
<i>limit_deposit_decrease_num_mean</i>	62.82
<i>limit_deposit_decrease_num_sd</i>	62.68
<i>limit_deposit_increase_num_sd</i>	62.18
<i>country_code_num_22</i>	61.64
<i>country_code_num_12</i>	61.39
<i>deposit_approved_sum_sd</i>	61.08
<i>small_turnover_cash_sports_sum_ratio</i>	61.04
<i>turnover_cash_sum_beta</i>	59.68
<i>medium_withdrawal_canceled_day_num_ratio</i>	59.59
<i>small_limit_deposit_increase_num_mean</i>	59.45
<i>country_code_num_2</i>	59.35

Table 2: Variables with an importance greater than 50% in the multiclass neural network model.

MODEL 1	MODEL 2A	MODEL 2B
Variable Name	Variable Name	Variable Name
<i>date_delta</i>	<i>date_delta</i>	<i>date_delta</i>
<i>turnover_cash_sum_sd</i>	<i>result_cash_sum_sd</i>	<i>balance_cash_sum</i>
<i>medium_turnover_cash_sum_mean</i>	<i>turnover_cash_day_num_ratio</i>	<i>small_bet_midnight_num_ratio</i>
<i>small_turnover_cash_num_mean</i>	<i>turnover_cash_sum_mean</i>	<i>small_turnover_cash_sports_sum_ratio</i>
<i>medium_bonus_convert_sum_mean</i>	<i>small_turnover_cash_casino_live_sum_ratio</i>	<i>bonus_convert_sum_mean</i>
<i>deposit_approved_day_num_ratio</i>	<i>exclusion_delta</i>	<i>medium_bonus_convert_day_num_ratio</i>
<i>deposit_approved_num_mean</i>	<i>limit_deposit_decrease_day_num_ratio</i>	<i>medium_bonus_convert_sum_mean</i>
<i>deposit_approved_sum_sd</i>	<i>small_limit_deposit_increase_num_mean</i>	<i>medium_limit_deposit_decrease_day_num_ratio</i>
<i>deposit_denied_num_sd</i>	<i>deposit_approved_sum_mean</i>	<i>deposit_denied_day_num_ratio</i>
<i>medium_deposit_approved_sum_mean</i>	<i>deposit_denied_num_mean</i>	<i>small_deposit_approved_sum_mean</i>
<i>medium_deposit_denied_num_mean</i>	<i>medium_deposit_approved_sum_mean</i>	<i>medium_withdrawal_approved_day_num_ratio</i>
<i>small_deposit_approved_sum_mean</i>	<i>medium_withdrawal_deposit_approved_sum_ratio</i>	<i>session_num_mean</i>
<i>small_deposit_denied_num_mean</i>	<i>session_day_num</i>	<i>small_session_day_num</i>
<i>withdrawal_approved_day_num_ratio</i>	<i>session_num_sd</i>	<i>small_session_desktop_num_ratio</i>
<i>withdrawal_approved_num_sd</i>	<i>country_code_num_3</i>	<i>title_2</i>
<i>session_num_mean</i>	<i>country_code_num_4</i>	<i>gender_2</i>
<i>brand_num</i>	<i>country_code_num_5</i>	<i>country_code_num_4</i>
<i>title_2</i>	<i>country_code_num_6</i>	<i>country_code_num_7</i>
<i>title_3</i>	<i>country_code_num_8</i>	<i>country_code_num_8</i>
<i>country_code_num_5</i>	<i>country_code_num_9</i>	<i>country_code_num_9</i>
<i>country_code_num_8</i>	<i>country_code_num_12</i>	<i>country_code_num_12</i>
<i>country_code_num_9</i>		<i>country_code_num_22</i>

Table 3: Variables included in the final model for models 1, 2A and 2B in the two-stage binary BNN approach.