

Knowledge Based Authentication (KBA) Metrics

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KBA Guessability Metrics ($p_{i,j}$)

	Spouse	Family	Friend	Employer	Professional	Others
Date of Birth	1	1	1	1	1	1 in 18250 or 2^{-14}
Place of Birth	1	1	?	1	1	?
Credit Card	1	$10^{-8} = 2^{-24}$	$10^{-8} = 2^{-24}$	$10^{-8} = 2^{-24}$	$10^{-8} = 2^{-24}$	$10^{-8} = 2^{-24}$
Home Address	1	1	1	1	1	1
Phone Number	1	1	1	1	1	1
Cell Phone	1	1	1	1 in 16,000 = 2^{-14}	1	1 in 16,000 = 2^{-14}
Mother's Maiden Name	1	1	?	?	?	?
AGI	1	1 in 10,000 = 2^{-13}	1 in 10,000 = 2^{-13}	1 in 10,000 = 2^{-13}	1	1 in 100,000 = 2^{-17}
Tax	1	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}	1	1 in 10,000 = 2^{-13}
Social Security Number	1	2^{-15}	2^{-15}	1	1	2^{-15}
Bank Statement Balance	1	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}
Credit Card Balance	1	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}	1 in 1,000 = 2^{-10}

Last Pay Stub Information is not a good candidate since the information may not be easily available to the verifier.

W2 information could include other information such as state income tax. Gross income, social security tax, medicare tax are not good candidates since they are guessable from gross income. Even retirement plan deduction will have very low entropy.

Year of Birth= Someone can be assumed to be between 20 and 70 years of age

Date of Birth = year * days = 50 * 365 = 18,250

Credit Card guessing = Middle 8 digit

Home Address Anyone may get from phone book

Phone Number listed

Cell Phone Number knows the areas code: No more than 16 exchanges

Some may know AGI to nearest 10,000. Once that is known, tax may be guessed within 1,000

AGI Not known but less than 100,000

Tax not known but less than 10,000

Social Security Number -- first three digits are based on place of issuance, which are well known and can be guessed based on the place of birth assuming SSN is obtained at or around time of birth. Assumes one check digit. Could be more. Thus entropy more akin to 5 digits = $10^5 = 2^{15}$.

Bank Statement and Credit Card based on balance of up to \$1,000