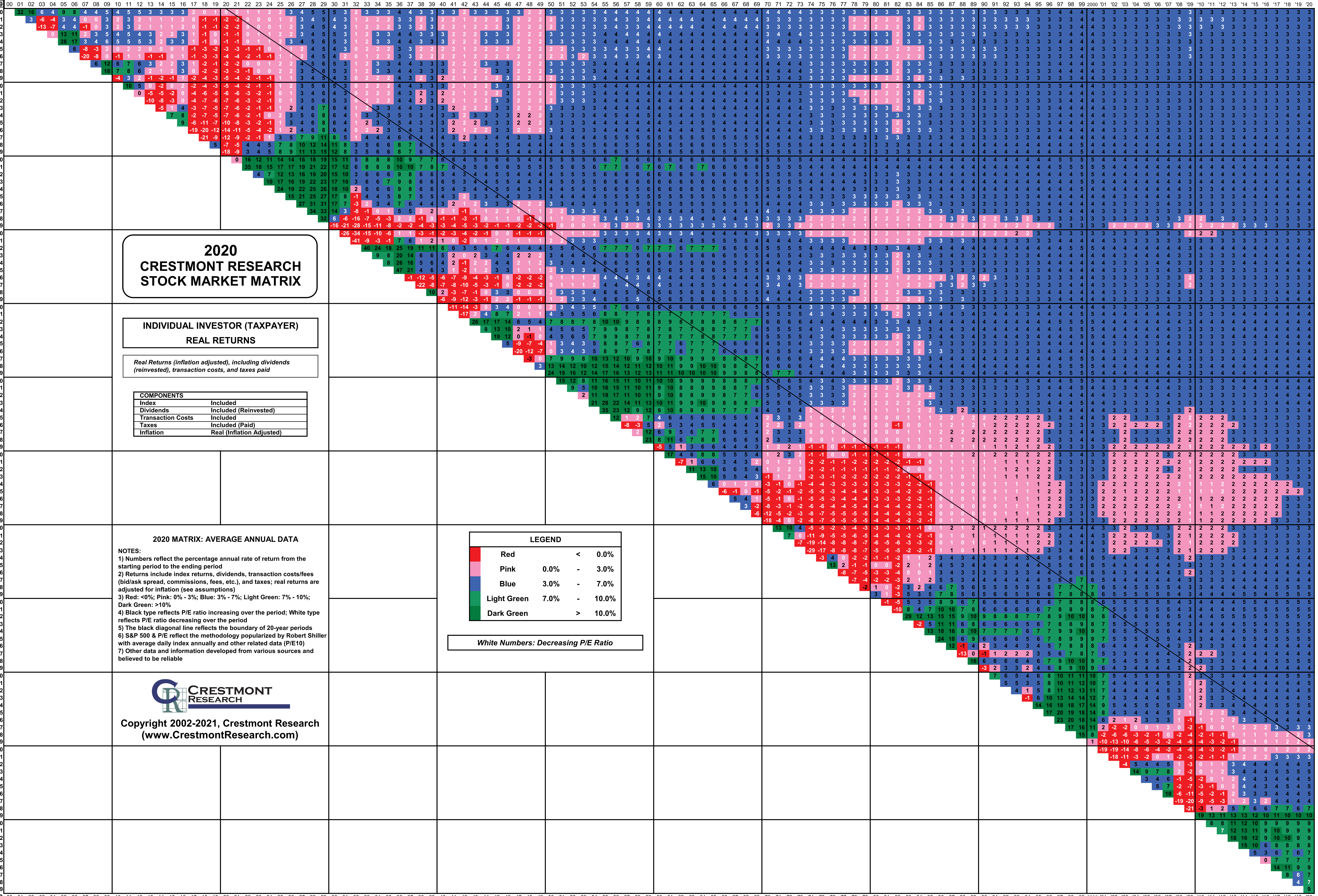
2020 CRESTMONT RESEARCH STOCK MARKET MATRIX

INDIVIDUAL INVESTOR (TAXPAYER) REAL RETURNS

Real Returns (inflation adjusted), including dividends (reinvested), transaction costs, and taxes paid

COMPONENTS	
Index	Included
Dividends	Included (Reinvested)
Transaction Costs	Included
Taxes	Included (Paid)
Inflation	Real (Inflation Adjusted)



TO (Yr: 19)	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
P/E Ratio	19	23	22	18	16	19	19	13	13	15	14	14	14	12	11	11	12	9	6	7	5	5	8	8	8	10	12	16	22	28
1899 = 1	1	1	1	1	1	1	2	1	1	2	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	2	2	2	3	4

TO (Yr: 19)	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
P/E Ratio	21	15	8	11	12	13	19	18	14	16	15	12	9	11	11	13	14	11	11	10	11	12	12	12	14	18	18	16	15	18
1899 = 1	4	3	2	2	2	3	4	4	3	3	3	3	2	3	3	4	4	3	3	3	4	4	5	5	6	8	9	8	8	10

TO (Yr: 19)	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
P/E Ratio	17	20	19	20	23	23	21	22	21	19	15	17	18	16	11	10	12	10	9	9	9	8	7	10	9	11	13	16	14	17
1899 = 1	10	11	10	12	13	14	13	14	14	13	11	12	13	12	9	8	10	9	8	8	8	8	7	10	9	11	13	15	13	15

"TO" Year	90	91	92	93	94	95	96	97	98	99	2000	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20
P/E Ratio	16	18	20	21	20	23	26	31	36	42	42	32	26	24	26	26	26	27	21	17	21	22	21	23	25	26	26	30	31	29	30
1899 = 1	14	15	16	17	17	19	22	27	32	37	37	30	25	24	27	28	30	32	26	21	25	27	28	33	38	40	40	46	50	52	57

FROM	P/E	1899=1	Event
1900	18.6	1	Rodin Completes 'The Thinker'
1901	22.7	1	First Electric Typewriter
1902	22.0	1	Navy Installs Radio
1903	17.6	1	Wright Bros Fly
1904	16.3	1	Crayola & Jell-O
1905	19.3	1	Pen Gets Pocket Clip
1906	18.7	2	S.F. Earthquake
1907	13.4	1	Photocopier Marketed
1908	13.1	1	Model T Introduced
1909	14.9	2	Chlorine In Drinking Water
1910	13.5	1	Electric Range Invented
1911	14.2	2	Sherman Anti-Trust Act; Airmail Begins
1912	13.7	2	Titanic Sinks; U.S. Radio Act
1913	11.9	1	Income Tax & Federal Reserve
1914	11.1	1	WWI Starts; First Transcon. Phone Call
1915	11.5	1	Americans Avg 40 Phone Calls A Year
1916	12.0	2	Keds & Electric Clock Invented
1917	8.8	1	US Enters WWI; Einstein Theorizes Lasers
1918	6.4	1	WWI Ends
1919	6.5	1	Prohibition; Shortwave Radio; Dial Phones
1920	5.3	1	Women's Right To Vote
1921	5.4	1	World Series On Radio; Quartz Crystals
1922	7.5	1	100,000 Radios Made In U.S.; 3 Frequencies
1923	7.9	1	500,000 Radios Made; Neon Signs
1924	8.4	1	2.5 Million Radios Made; Frozen Food Invented
1925	10.1	2	Commercial Picture Fax By Radio In U.S.
1926	11.7	2	First Publicly Shown 'Talkie'
1927	15.9	2	2-Way Radio Phone: U.S. To London ($15/min)
1928	21.8	3	Teletype Machine; Test TV In 3 Homes
1929	27.6	4	Crash of '29; Car Radio
1930	21.5	4	Photo Flash Bulbs
1931	14.7	3	Radios In 40% Of Homes; Scotch Tape
1932	8.1	2	Radar; 8 mm Cameras; Electric Eye Scanner
1933	11.1	2	End of Prohibition; FM Radio; Wallboard
1934	12.2	2	Radios In 50% Of Homes; AP Wirephoto
1935	13.1	3	Social Security Act Passed
1936	19.3	4	BBC First TV Service, 3 Hours A Day
1937	18.5	4	Hindenburg Airship Crash
1938	13.9	3	National Minimum Wage Enacted
1939	15.6	3	WW II Begins; Regular TV In U.S.; Helicopter
1940	14.7	3	FM Radio; Radar; 1st Social Security Check
1941	12.2	3	Pearl Harbor Attack; 2-Way Police Radio
1942	9.2	2	U.S. Office Of Censorship Due To War
1943	11.0	3	Phone Line Repeaters Help Service
1944	11.3	3	D-Day, Normandy
1945	13.3	4	World War II Ends; FCC Sets VHF Channels
1946	14.0	4	ENIAC, 1st Computer; First Copy Machine Sold
1947	11.2	3	Transistor Invented; Microwave Oven
1948	10.7	3	Israel Established; RCA High Speed Fax
1949	9.9	3	NATO Established; Network TV In U.S.
1950	11.2	4	Korean War Begins; Credit Card Created
1951	12.0	4	Color TV; Modern Plastic Invented
1952	12.5	5	Phone Area Codes; EDVAC Computer
1953	12.0	5	Korean War Ends; Magnetic Core Memory
1954	13.7	6	TVs In 54% Of Homes; Transistor Radios
1955	17.5	8	Tests Begin On Digital Fiber Optics
1956	18.3	9	Transatlantic Phone Cable; The Pager
1957	15.6	8	Sputnik, First Satellite; EEC Formed
1958	15.1	8	Stereo LP Records; Data On Phone Lines
1959	18.4	10	COBOL; Microchip; Plain Paper Xerox
1960	17.4	10	90% Homes w/TVs; Laser; Weather Satellite
1961	20.5	11	Berlin Wall Built; IBM Selectric Typewriter
1962	18.8	10	Cuban Missile Crisis; Mariner II At Venus
1963	20.3	12	Kennedy Killed, Income Tax 91% To 70%
1964	22.6	13	Vietnam Begins; Home VCR
1965	23.3	14	First Minicomputer; Car Phones; Hypertext
1966	21.3	13	Dow @ 1,000; 8-Tracks In Cars; Fax Machine
1967	21.6	14	Floppy Disk; Cordless Phones; Dolby
1968	21.5	14	Intelsat Global Satellite Link; Intel 1KB RAM
1969	19.4	13	Neil Armstrong Walks On Moon; ATMs
1970	15.2	11	Barcodes; First Internet Connections
1971	16.9	12	Microchip, Price Controls; Answering Machine
1972	17.8	13	Dow Closes Above 1,000; Pong; HBO
1973	16.1	12	U.S. Leaves Vietnam; International Internet
1974	10.9	9	Nixon Resigns; Wage & Price Controls End
1975	10.2	8	Microsoft; Optical Videodisk Demo
1976	11.5	10	Apple I; Cray-1; Home Satellite Dish
1977	10.4	9	Elvis Dies; TRS-80 PC; Fiber Optic Call
1978	9.4	8	Modems; Cell Phone Tests; Intel 16-bit Chip
1979	8.9	8	CompuServe Online; VisiCalc Spreadsheet
1980	8.8	8	CPI 13.5%; CNN; Sony Camcorder
1981	8.5	8	IBM PC Introduced; 300 bps Modems
1982	7.3	7	Dow Over 1,000; Compact Disk; 5.5 Mil. PCs
1983	9.6	10	AT&T Breakup; 288k Chips; Domain Names
1984	9.4	9	3 1/2" Floppy; Intel 32-bit; 1 MB Chips
1985	10.7	11	Cellphones; 2400k Modems; Windows OS
1986	13.4	13	Laser Printers; TV On 7 Hrs/Day In U.S.
1987	16.0	15	Stock Market Crash; 50% Have Cable TV
1988	14.4	13	Transatlantic Fiberoptic Cable; Internet T1
1989	16.6	15	Poland Solidarity; Nintendo Profits @ $1 Bil.
1990	16.5	14	World Wide Web (www)
1991	17.9	15	Gulf War; USSR Breakup; 75% Have VCRs
1992	19.6	16	65 Mil. PCs; 200k On AOL; CDs > Cassettes
1993	20.7	17	Pentium Chip; HTML; V-Chip
1994	20.5	17	First WTC Attack; Satellite TV; 33% w/PC
1995	22.7	19	NAFTA Enacted; Dot.com; Internet Audio
1996	25.9	22	100k Web Sites; 30 Mil In U.S. On Internet
1997	31.0	27	Internet Video; 43% In U.S. Have PCs
1998	36.0	32	Russia Debt Default; 75 Mil U.S. On Internet
1999	42.1	37	Satellite Can See 3' Objects On Earth
2000	41.7	37	Dow Hits 11,723; NASDAQ Hits 5,048
2001	32.1	30	WTC Attack (9/11); >50% U.S. On Internet; iPod
2002	25.9	25	HDTV Grows; Wi-Fi Laptops; DVD Sales>VCR
2003	24.1	24	Iraq Conflict; Home Networks; T-Bills @ <1%
2004	26.4	27	Hybrid Cars; Flat Panel TVs; Blogs; VoIP
2005	26.0	28	Hurricanes; $70 Oil; Podcasts; Housing Boom
2006	26.0	30	YouTube; Dow High; Pluto Demoted; Fed Pause
2007	26.8	32	iPhone; Sub-Prime; Going Green; Facebook
2008	20.8	26	Recession; Wall Street Crisis; $144 Oil; Obama
2009	16.9	21	H1N1; Jackson Dies; GM Bankruptcy; Digital TV
2010	20.7	25	iPad; Greece Debt Crisis; Twitter; QE2
2011	21.8	27	The Cloud; Arab Spring; OWS; E-books
2012	21.4	28	Google Glass; Mars Rover; iPhone5; Fiscal Cliff
2013	23.2	33	Fed Taper; Detroit Ch 9; NSA; ACA Launch; Nest
2014	25.5	38	Ebola; ISIS; Amazon Drones; Wearable Tech
2015	26.2	40	ZIRP Ends; Iran Deal; Refugees; Driverless Car
2016	26.1	40	Brexit; Trump; <$30 Oil; Cyborg Stingray
2017	29.9	46	Bitcoin Mania; Robot Citizen; Teleporting; WattUp
2018	31.5	50	Apple $1T; Tax Reform; Zero Carbon Nat Gas; 5G
2019	29.4	52	UPS Drones; Quantum Supremacy; Starlink L1
2020			Covid; Zoom; ZIRP II; mRNA Vaccine; Dow 30k

Yr: 19	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
S&P 500 Index Value	6	8	8	7	7	9	10	8	8	10	9	9	10	9	8	8	9	8	8	9	8	7	8	9	9	11	13	15	20	26
S&P 500 Div Yield (%)	4	4	4	5	5	4	4	5	5	4	5	5	5	6	6	5	5	7	8	6	7	7	6	6	6	5	5	5	4	4
CPI (Inflation %)	7	-2	6	1	0	1	3	6	-4	8	4	-8	7	3	1	1	8	17	18	15	16	-11	-6	2	0	2	1	-2	-2	0
GDP (Nominal %)	4	13	3	6	5	9	8	3	-7	12	5	3	8	5	-6	6	27	20	26	11	13	-16	0	17	3	4	7	-1	1	7
GDP (Annualized %)	+5.3%										+10.0%										+3.1%									
GDP (Real %)	2	12	2	3	4	9	4	-2	-5	12	0	3	6	4	-8	4	16	0	8	-3	-2	-4	7	14	3	2	6	1	2	7
GDP (Annualized %)	+3.9%										+2.9%										+3.4%									

Yr: 19	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
S&P 500 Index Value	21	14	7	9	10	11	15	15	11	12	11	10	9	12	12	15	17	15	16	15	18	22	24	25	30	40	47	44	46	57
S&P 500 Div Yield (%)	5	7	9	5	5	4	4	5	6	5	6	7	7	5	5	4	4	5	6	7	7	7	6	6	5	4	4	4	4	3
CPI (Inflation %)	-2	-9	-10	-5	3	2	1	4	-2	-1	1	5	11	6	2	2	8	14	8	-1	1	8	2	1	1	0	1	3	3	1
GDP (Nominal %)	-12	-16	-23	-4	17	11	14	10	-6	7	10	26	28	22	10	2	0	10	10	-1	10	16	6	6	0	9	6	5	2	8
GDP (Annualized %)	-1.1%										+11.3%										+6.7%									
GDP (Real %)	-9	-6	-13	-1	11	9	13	5	-3	8	9	18	19	17	8	-1	-12	-1	4	-1	9	8	4	5	-1	7	2	2	-1	7
GDP (Annualized %)	+1.0%										+5.6%										+4.2%									

Yr: 19	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89
S&P 500 Index Value	56	66	62	70	81	88	85	92	98	98	83	98	109	107	83	86	102	98	96	103	119	128	120	160	160	187	236	287	266	323
S&P 500 Div Yield (%)	3	3	3	3	3	3	3	3	3	3	4	3	3	3	4	4	4	4	5	5	5	5	6	4	5	4	3	3	3	3
CPI (Inflation %)	2	1	1	1	1	2	3	3	4	5	6	4	3	6	11	9	6	7	8	11	13	10	6	3	4	4	2	4	4	5
GDP (Nominal %)	4	4	7	6	7	8	10	6	9	8	5	9	10	11	8	9	11	11	13	12	9	12	4	9	11	7	6	6	8	8
GDP (Annualized %)	+6.9%										+9.9%										+7.9%									
GDP (Real %)	3	3	6	4	6	6	7	3	5	3	0	3	5	6	-1	0	5	5	6	3	0	3	-2	5	7	4	3	3	4	4
GDP (Annualized %)	+4.5%										+3.2%										+3.1%									

Yr	90	91	92	93	94	95	96	97	98	99	2000	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	Avg	
S&P 500 Index Value	335	376	416	452	460	542	670	873	1086	1327	1427	1194	994	965	1131	1207	1310	1477	1220	948	1140	1268	1379	1644	1931	2061	2095	2449	2746	2913	3218		
S&P 500 Div Yield (%)	3	3	3	3	3	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4.1%	Avg (S&P 500 Div Yield %)
CPI (Inflation %)	5	4	3	3	3	3	3	2	2	2	3	3	2	2	3	3	3	3	4	0	2	3	2	1	2	0	1	2	2	2	1	3.1%	Avg (CPI Inflation %)
GDP (Nominal %)	6	3	6	5	6	5	6	6	6	6	6	3	3	5	7	7	6	5	2	-2	4	4	4	4	4	4	3	4	5	4	-2		
GDP (Annualized %)	+5.5%										+4.1%										+4.0%											+6.1%	Avg (GDP Nominal %)
GDP (Real %)	2	0	4	3	4	3	4	4	4	5	4	1	2	3	4	4	3	2	0	-3	3	2	2	2	3	3	2	2	3	2	-4		
GDP (Annualized %)	+3.2%										+1.9%										+2.3%											+3.3%	Avg (GDP Real %)

2020 MATRIX: AVERAGE ANNUAL DATA

NOTES:
1) Numbers reflect the percentage annual rate of return from the starting period to the ending period
2) Returns include index returns, dividends, transaction costs/fees (bid/ask spread, commissions, fees, etc.), and taxes; real returns are adjusted for inflation (see assumptions)
3) Red: <0%; Pink: 0% - 3%; Blue: 3% - 7%; Light Green: 7% - 10%; Dark Green: >10%
4) Black type reflects P/E ratio increasing over the period; White type reflects P/E ratio decreasing over the period
5) The black diagonal line reflects the boundary of 20-year periods
6) S&P 500 & P/E reflect the methodology popularized by Robert Shiller with average daily index annually and other related data (P/E10)
7) Other data and information developed from various sources and believed to be reliable

LEGEND				
Red		<	0.0%
Pink	0.0%	-	3.0%
Blue	3.0%	-	7.0%
Light Green	7.0%	-	10.0%
Dark Green		>	10.0%

White Numbers: Decreasing P/E Ratio

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