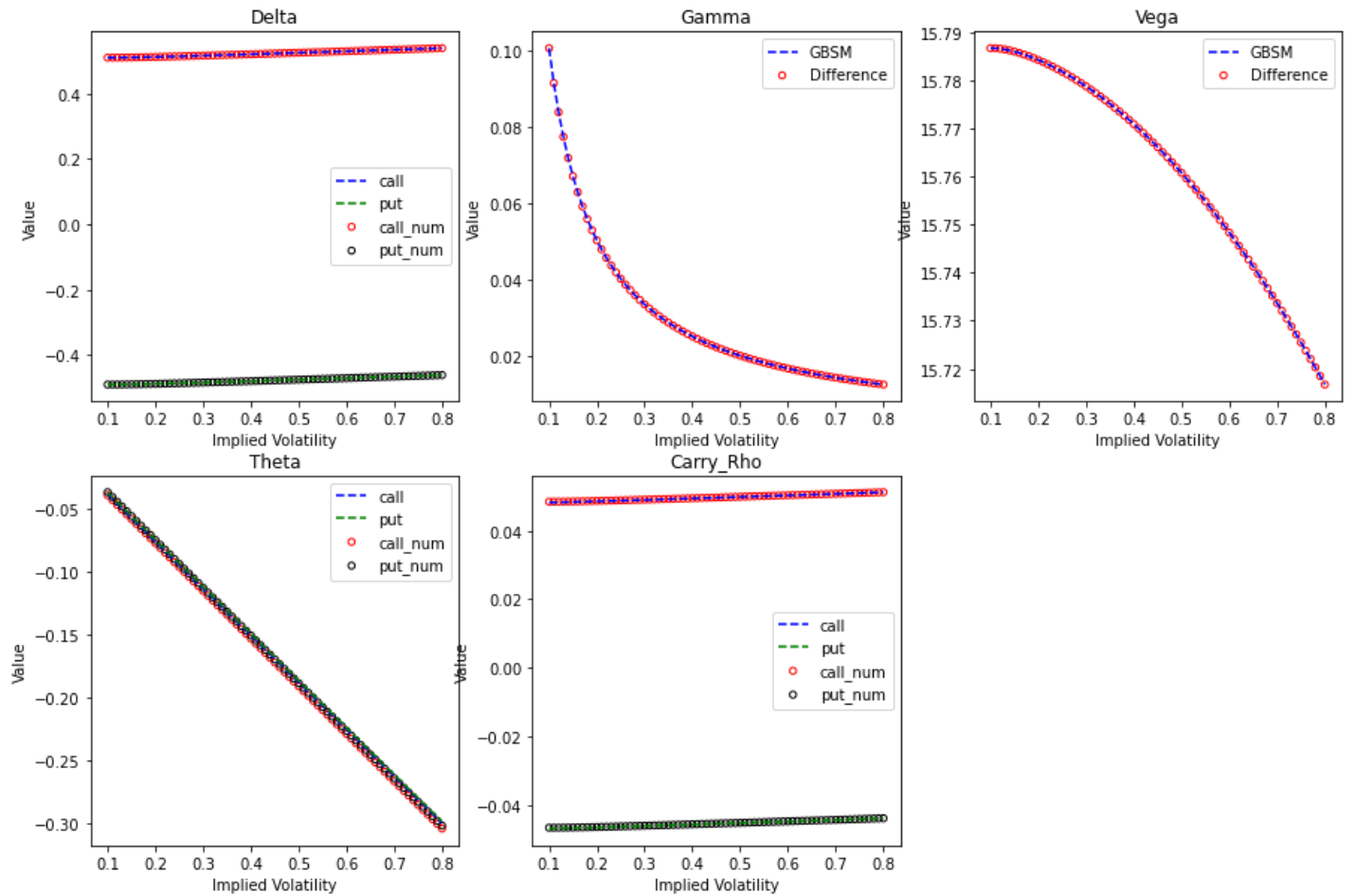


Project Week 07

Hongren Jiang

Problem 1



Problem 1


Option	Value
American Call No Dividends	3.97
American Call with Dividends	3.82
American Put No Dividends	4.01
American Put with Dividends	4.45

Problem2

Out[24]:

	Portfolio	Underlying	Mean	VaR	ES
0	Straddle	AAPL	1.874196	9.856226	13.002757
2	SynLong	AAPL	-3.036837	15.504653	19.049275
4	CallSpread	AAPL	-0.529274	6.776529	8.503587
6	PutSpread	AAPL	-10.399151	16.206265	17.724866
8	Stock	AAPL	0.182732	13.383667	16.883853
9	Call	AAPL	-0.581320	9.543464	11.495619
10	Put	AAPL	2.455516	6.059890	8.457017
11	CoveredCall	AAPL	0.764053	6.728945	8.721250
13	ProtectedPut	AAPL	2.638249	9.196510	12.306327

Problem 03



J:

	Mkt-RF	SMB	HML	Mom	annual_return
AAPL	1.20745	-0.0447555	-0.745516	-0.0586872	18.7174
FB	1.10494	-0.00631237	-0.473366	0.135554	17.3748
UNH	0.91327	-0.0207017	0.031415	0.10484	14.1086
MA	1.17245	-0.202772	-0.0604724	-0.02239	17.8826
MSFT	1.15734	-0.2892	-0.653624	-0.0392818	18.1936
NVDA	1.57429	0.644442	-0.948338	-0.221693	23.2155
HD	1.10911	-0.12025	-0.1076	-0.00822937	16.9429
PFE	0.798328	-0.474389	-0.124675	0.03105	12.8459
AMZN	1.32832	0.0865737	-0.988971	-0.141629	20.3754
BRK-B	0.657435	-0.102592	0.450887	0.0309132	9.94745
PG	0.631807	-0.626466	0.00759169	0.106529	10.6151
XOM	0.857474	-0.360208	0.490131	0.0351335	13.1065
TSLA	1.31013	0.731427	-0.72051	0.153635	19.8845
JPM	1.40848	-0.257129	0.934966	-0.244645	20.103
V	1.02002	-0.194142	-0.00651667	-0.00584372	15.6358
DIS	1.06665	-0.130206	0.0854321	-0.0900459	15.9992
GOOGL	1.0422	-0.143263	-0.321108	0.02859	16.2395
JNJ	0.662047	-0.575341	-0.127899	0.0837811	11.0681
BAC	1.40771	-0.248272	1.33327	-0.33537	19.5643
CSCO	1.31277	-0.0298045	-0.838135	-0.319303	19.7596

Problem03

	AAPL	FB	UNH	MA	MSFT	NVDA	HD	PFE	AMZN	BRK-B	PG	XOM	TSLA	JPM	V	DIS	GOOGL	JNJ	BAC	CSCO
AAPL	0.08023291	0.04325116	0.02865275	0.03888607	0.0427356	0.05815209	0.02945987	0.01727841	0.03977728	0.02435452	0.01729601	0.02179395	0.05284046	0.02946525	0.03422064	0.02608899	0.03818784	0.01692633	0.03320705	0.03363359
FB	0.04325116	0.14298497	0.02612151	0.04171797	0.04245216	0.06124324	0.02765621	0.01677292	0.05333629	0.02289085	0.01331186	0.01955209	0.05627803	0.02870259	0.03832129	0.02812702	0.04919994	0.01561103	0.03346414	0.02899552
UNH	0.02865275	0.02612151	0.06352828	0.03198603	0.03045007	0.03630491	0.02795677	0.02256568	0.02394482	0.02575187	0.01764021	0.02455793	0.02892264	0.03191832	0.02956054	0.02381979	0.0273472	0.02107212	0.03544417	0.02603784
MA	0.03888607	0.04171797	0.03198603	0.07116632	0.04163226	0.05423011	0.03192885	0.02197162	0.03894503	0.03063908	0.01923304	0.03197833	0.04669937	0.04077758	0.05676924	0.03770968	0.03986202	0.02088419	0.04526657	0.03552799
MSFT	0.0427356	0.04245216	0.03045007	0.04163226	0.06690268	0.06095506	0.0311292	0.01941994	0.04413024	0.02551426	0.01946353	0.02203213	0.05066229	0.03184163	0.03783871	0.0279076	0.04354772	0.0194844	0.03497914	0.03658031
NVDA	0.05815209	0.06124324	0.03630491	0.05423011	0.06095506	0.17579404	0.04065171	0.01977685	0.05732752	0.02995274	0.01838714	0.02674597	0.08073901	0.03879065	0.04775071	0.03487602	0.05371068	0.01887552	0.045727	0.04641504
HD	0.02945987	0.02765621	0.02795677	0.03192885	0.0311292	0.04065171	0.05234842	0.01754228	0.02595395	0.02435419	0.01757923	0.02234961	0.03735661	0.03101137	0.03007068	0.02712337	0.02768259	0.01706553	0.03345917	0.02714855
PFE	0.01727841	0.01677292	0.02256568	0.02197162	0.01941994	0.01977685	0.01754228	0.04489858	0.01469253	0.01888104	0.01550951	0.01759878	0.01424045	0.0228529	0.021321	0.01661165	0.01814735	0.02002462	0.02418444	0.02117365
AMZN	0.03977728	0.05333629	0.02394482	0.03894503	0.04413024	0.05732752	0.02595395	0.01469253	0.09246941	0.01971391	0.01275257	0.01692311	0.05695988	0.02304606	0.0341979	0.0250318	0.04612565	0.01461728	0.02777033	0.02927934
BRK-B	0.02435452	0.02289085	0.02575187	0.03063908	0.02551426	0.02995274	0.02435419	0.01888104	0.01971391	0.03471013	0.01650568	0.02894941	0.02505304	0.03765424	0.02852739	0.02688154	0.02335662	0.01847782	0.04194722	0.02599455
PG	0.01729601	0.01331186	0.01764021	0.01923304	0.01946353	0.01838714	0.01757923	0.01550951	0.01275257	0.01650568	0.03155324	0.01440034	0.01272133	0.01724604	0.01812223	0.01563631	0.01593919	0.01725018	0.01828798	0.018788
XOM	0.02179395	0.01955209	0.02455793	0.03197833	0.02203213	0.02674597	0.02234961	0.01759878	0.01692311	0.02894941	0.01440034	0.06486009	0.02675691	0.04024422	0.02837852	0.02974973	0.02284252	0.0174441	0.04519417	0.02676929
TSLA	0.05284046	0.05627803	0.02892264	0.04669937	0.05066229	0.08073901	0.03735661	0.01424045	0.05695988	0.02505304	0.01272133	0.02675691	0.31273512	0.03490739	0.0408176	0.03483457	0.04715227	0.01367532	0.04144138	0.03556767
JPM	0.02946525	0.02870259	0.03191832	0.04077758	0.03184163	0.03879065	0.03101137	0.0228529	0.02304606	0.03765424	0.01724604	0.04024422	0.03490739	0.07095508	0.03719701	0.03749435	0.02907405	0.02005456	0.07318685	0.03283801
V	0.03422064	0.03832129	0.02956054	0.05676924	0.03783871	0.04775071	0.03007068	0.021321	0.0341979	0.02852739	0.01812223	0.02837852	0.0408176	0.03719701	0.06021505	0.03340664	0.03613641	0.01978404	0.04170909	0.031722
DIS	0.02608899	0.02812702	0.02381979	0.03770968	0.0279076	0.03487602	0.02712337	0.01661165	0.0250318	0.02688154	0.01563631	0.02974973	0.03483457	0.03749435	0.03340664	0.06168765	0.02701266	0.01596517	0.04157142	0.02888133
GOOGL	0.03818784	0.04919994	0.0273472	0.03986202	0.04354772	0.05371068	0.02768259	0.01814735	0.04612565	0.02335662	0.01593919	0.02284252	0.04715227	0.02907405	0.03613641	0.02701266	0.06514053	0.0169785	0.03331409	0.02986836
JNJ	0.01692633	0.01561103	0.02107212	0.02088419	0.0194844	0.01887552	0.01706553	0.02002462	0.01461728	0.01847782	0.01725018	0.0174441	0.01367532	0.02005456	0.01978404	0.01596517	0.0169785	0.03023294	0.02073389	0.02053944
BAC	0.03320705	0.03346414	0.03544417	0.04526657	0.03497914	0.045727	0.03345917	0.02418444	0.02777033	0.04194722	0.01828798	0.04519417	0.04144138	0.07318685	0.04170909	0.04157142	0.03331409	0.02073389	0.09664001	0.03791993
CSCO	0.03363359	0.02899552	0.02603784	0.03552799	0.03658031	0.04641504	0.02714855	0.02117365	0.02927934	0.02599455	0.018788	0.02676929	0.03556767	0.03283801	0.031722	0.02888133	0.02986836	0.02053944	0.03791993	0.06262532

Problem03

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OrderedDict([('AAPL', 0.0), ('FB', 0.0), ('UNH', 0.27987), ('MA', 0.0), ('MSFT', 0.0), ('NVDA', 0.30763), ('HD', 0.04208), ('PFE', 0.0), ('AMZN', 0.08806), ('BRK-B', 0.0), ('PG', 0.0), ('XOM', 0.0), ('TSLA', 0.20514), ('JPM', 0.0), ('V', 0.0), ('DIS', 0.0), ('GOOGL', 0.0), ('JNJ', 0.07721), ('BAC', 0.0), ('CSCO', 0.0)])
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Expected annual return: 45.4%

Annual volatility: 25.9%

Sharpe Ratio: 1.68

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