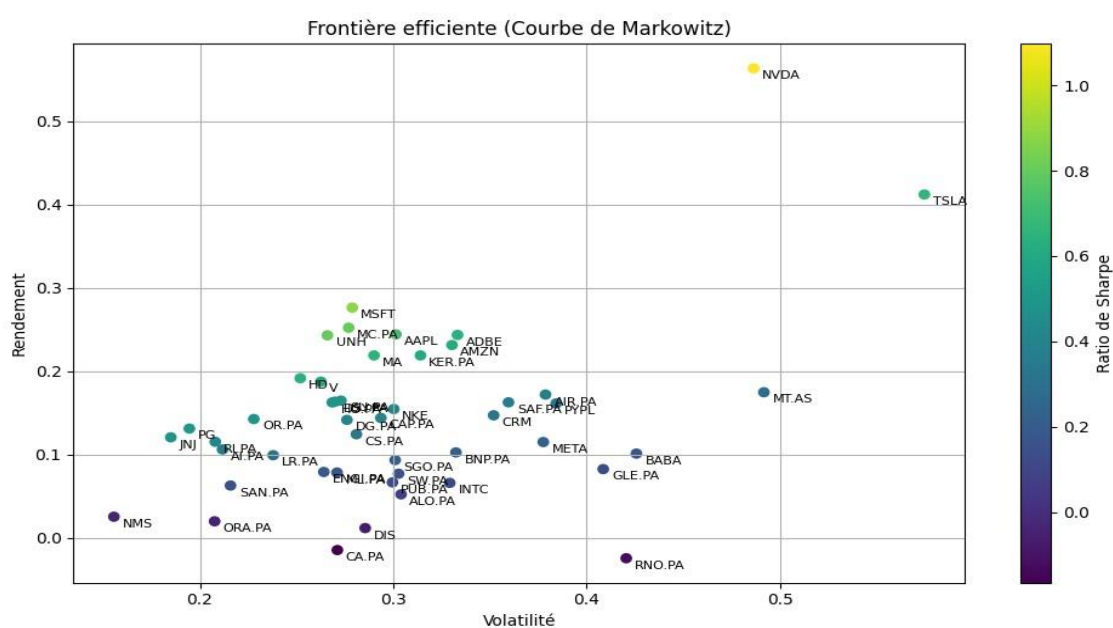


Appendix 3: Portfolio 2 Correlation Matrix (also available in Excel)

	AAPL	ADBE	ALFA	AR.PA	ALOP.A	AMZN	BABA	BNP.PA	CA.PA	CRM	CSPA	DG.PA	DIS	DS.PA	ENGL.PA	GLE.PA	HD	HOP.A	INTC	JNJ	KER.PA	LR.PA	MA	MC.PA	META	MIL.PA	MFT	MTAS	NE	NM.S	NDA	OC.PA	OR.PA	PG	PUB.PA	PY.PA	RIP.A	RNO.PA	SAP.PA	SA.PA	SC.PA	SUP.A	SW.PA	TE.SA	UNH	V	
AAPL	1.000	0.947	0.933	0.819	0.666	0.945	0.296	0.602	-0.513	0.809	0.914	0.859	0.846	0.827	0.960	0.188	-0.179	0.962	0.783	0.760	0.911	0.922	0.988	0.940	0.984	0.780	0.830	0.986	-0.338	0.947	0.763	0.959	0.965	-0.045	0.946	0.624	0.698	0.907	-0.029	0.803	0.852	0.715	0.972	0.615	0.952	0.970	0.918
ADBE	0.947	1.000	0.917	0.859	0.210	0.989	0.595	0.595	-0.513	0.797	0.973	0.839	0.868	0.878	0.971	0.150	-0.154	0.965	0.788	0.858	0.906	0.971	0.911	0.966	0.954	0.936	0.847	0.974	-0.345	0.969	0.752	0.932	0.960	-0.015	0.926	0.570	0.902	0.904	0.028	0.856	0.834	0.701	0.937	0.628	0.837	0.931	0.961
ALFA	0.933	0.917	1.000	0.918	0.046	0.932	0.406	0.709	-0.640	0.747	0.956	0.936	0.958	0.930	0.952	0.205	-0.199	0.960	0.869	0.820	0.977	0.931	0.972	0.977	0.945	0.838	0.941	0.917	-0.485	0.967	0.722	0.844	0.973	-0.111	0.985	0.775	0.720	0.979	0.177	0.898	0.950	0.725	0.969	0.818	0.846	0.946	0.975
AR.PA	0.819	0.859	0.918	1.000	0.024	0.873	0.405	0.699	-0.603	0.907	0.897	0.925	0.962	0.926	0.921	0.192	-0.157	0.920	0.936	0.912	0.941	0.930	0.955	0.931	0.878	0.768	0.931	0.836	-0.506	0.908	0.443	0.745	0.916	0.648	0.900	0.772	0.477	0.957	0.301	0.984	0.902	0.666	0.867	0.858	0.584	0.993	0.923
ALOP.A	0.666	0.210	0.046	0.024	1.000	0.177	0.897	0.182	0.241	0.030	0.130	0.046	0.105	0.041	0.070	0.618	0.237	0.054	-0.002	0.179	-0.077	0.094	0.082	0.715	0.041	0.131	0.615	0.087	0.276	0.114	0.063	0.115	0.064	-0.382	0.717	0.033	-0.051	0.061	-0.127	0.177	0.046	-0.168	0.270	0.036	0.223		
AMZN	0.945	0.989	0.932	0.873	0.177	1.000	0.640	0.585	-0.560	0.788	0.932	0.846	0.889	0.898	0.970	0.116	-0.207	0.970	0.820	0.874	0.927	0.974	0.921	0.975	0.949	0.929	0.862	0.963	-0.401	0.972	0.738	0.909	0.964	-0.023	0.934	0.600	0.899	0.916	0.048	0.880	0.852	0.671	0.935	0.671	0.822	0.938	0.969
BABA	0.296	0.595	0.046	0.045	0.897	0.640	1.000	-0.020	-0.772	0.172	0.652	0.663	0.488	0.575	0.400	-0.039	-0.360	0.417	0.120	0.803	0.407	0.633	0.395	0.564	0.321	0.695	0.382	0.381	-0.003	0.476	0.309	0.290	0.363	-0.193	0.373	-0.605	0.680	0.364	-0.360	0.587	0.217	0.063	0.310	-0.090	0.161	0.162	0.579
BNP.PA	0.602	0.595	0.709	0.699	0.182	0.585	-0.020	1.000	-0.338	0.488	0.536	0.845	0.792	0.682	0.633	0.377	0.446	0.649	0.704	0.501	0.717	0.619	0.620	0.515	0.641	0.565	0.830	0.583	0.052	0.654	0.407	0.576	0.666	-0.201	0.694	0.698	0.138	0.758	0.613	0.624	0.699	0.889	0.704	0.703	0.535	0.666	0.648
CA.PA	-0.513	-0.513	-0.640	-0.603	0.241	-0.560	-0.772	-0.338	1.000	-0.120	-0.605	-0.479	-0.025	-0.575	-0.523	0.249	0.411	-0.544	0.497	-0.407	-0.633	-0.526	-0.548	-0.564	-0.521	-0.420	-0.595	-0.475	0.691	-0.591	-0.343	-0.414	-0.545	0.551	-0.632	-0.490	-0.556	-0.055	-0.029	-0.518	-0.591	-0.251	-0.548	-0.577	-0.229	-0.539	-0.512
CAP.PA	0.809	0.797	0.747	0.907	0.030	0.788	0.172	0.488	-0.120	1.000	0.923	0.793	0.709	0.742	0.862	0.308	-0.155	0.843	0.773	0.816	0.759	0.827	0.958	0.935	0.828	0.824	0.714	0.830	-0.372	0.788	0.734	0.802	0.833	0.498	0.731	0.699	0.591	0.723	0.079	0.808	0.705	0.603	0.797	0.602	0.860	0.815	0.937
CRM	0.914	0.973	0.956	0.897	0.130	0.982	0.652	0.556	-0.605	0.923	1.000	0.862	0.920	0.932	0.971	0.043	-0.328	0.967	0.813	0.932	0.941	0.972	0.947	0.970	0.971	0.943	0.899	0.955	-0.467	0.983	0.704	0.872	0.964	0.563	0.947	0.632	0.904	0.947	-0.023	0.918	0.879	0.618	0.933	0.709	0.792	0.911	0.970
CSPA	0.859	0.839	0.936	0.925	0.046	0.846	0.063	0.845	-0.479	0.793	0.862	1.000	0.958	0.908	0.965	0.321	0.015	0.917	0.922	0.788	0.948	0.875	0.938	0.885	0.891	0.746	0.957	0.846	-0.369	0.904	0.612	0.786	0.925	0.003	0.919	0.833	0.399	0.946	0.393	0.894	0.916	0.816	0.914	0.866	0.724	0.911	0.900
DG.PA	0.846	0.868	0.938	0.962	0.105	0.889	0.488	0.792	-0.625	0.709	0.920	0.958	1.000	0.930	0.909	0.223	-0.074	0.923	0.931	0.828	0.969	0.911	0.953	0.941	0.886	0.842	0.968	0.845	-0.447	0.924	0.643	0.759	0.928	-0.106	0.941	0.782	0.581	0.974	0.350	0.927	0.920	0.749	0.903	0.886	0.647	0.909	0.957
DIS	0.827	0.878	0.930	0.926	0.041	0.898	0.575	0.682	-0.575	0.742	0.932	0.908	0.930	1.000	0.909	0.124	-0.197	0.914	0.854	0.886	0.938	0.900	0.947	0.897	0.856	0.918	0.942	0.828	-0.561	0.946	0.647	0.739	0.923	-0.005	0.906	0.818	0.898	0.923	0.331	0.934	0.917	0.690	0.890	0.875	0.644	0.847	0.909
DS.PA	0.960	0.971	0.952	0.921	0.070	0.970	0.400	0.633	-0.523	0.862	0.971	0.905	0.909	0.909	1.000	0.168	-0.193	0.990	0.867	0.876	0.948	0.975	0.964	0.976	0.976	0.885	0.895	0.973	-0.430	0.978	0.750	0.925	0.989	0.043	0.948	0.700	0.769	0.946	0.094	0.909	0.893	0.712	0.963	0.730	0.862	0.966	0.974
ENGL.PA	0.188	0.150	0.205	0.192	0.618	0.116	-0.039	0.377	0.249	0.308	0.043	0.321	0.223	0.124	0.168	1.000	0.239	0.144	0.179	0.124	0.145	0.172	-0.155	-0.056	0.200	0.312	0.194	0.178	0.706	0.145	0.214	0.174	0.178	0.264	0.184	0.150	0.259	0.173	0.069	0.144	0.119	0.346	0.231	0.183	0.416	0.168	0.016
GLE.PA	-0.179	-0.154	-0.199	-0.157	0.237	-0.207	-0.360	0.446	0.411	-0.155	-0.328	0.015	-0.074	-0.197	-0.193	0.239	1.000	-0.183	-0.093	-0.247	-0.180	-0.183	-0.230	-0.255	-0.161	0.162	-0.038	-0.158	0.571	-0.202	-0.037	-0.090	-0.182	-0.130	-0.174	-0.152	-0.290	-0.106	0.530	-0.224	-0.151	0.426	-0.141	-0.172	0.134	-0.124	0.063
HD	0.962	0.965	0.960	0.920	0.054	0.970	0.417	0.649	-0.544	0.843	0.967	0.917	0.923	0.914	0.990	0.144	-0.183	1.000	0.879	0.865	0.964	0.970	0.972	0.980	0.975	0.887	0.906	0.969	-0.452	0.980	0.759	0.918	0.991	0.005	0.960	0.710	0.759	0.952	0.125	0.910	0.910	0.720	0.964	0.748	0.851	0.975	0.980
HOP.A	0.783	0.788	0.869	0.936	-0.004	0.820	0.120	0.704	-0.497	0.773	0.813	0.922	0.931	0.854	0.867	0.179	-0.093	0.879	1.000	0.808	0.926	0.858	0.870	0.840	0.828	0.622	0.892	0.787	-0.433	0.841	0.350	0.701	0.872	0.055	0.845	0.766	0.000	0.895	0.376	0.914	0.865	0.653	0.808	0.861	0.519	0.930	0.855
INTC	0.760	0.858	0.820	0.912	0.156	0.874	0.803	0.501	-0.407	0.816	0.932	0.788	0.828	0.886	0.876	0.124	-0.247	0.865	0.808	1.000	0.841	0.902	0.904	0.913	0.797	0.891	0.809	0.802	-0.495	0.858	0.491	0.710	0.848	0.282	0.793	0.654	0.759	0.807	0.184	0.928	0.787	0.543	0.787	0.731	0.550	0.792	0.921
JNJ	0.911	0.906	0.977	0.941	-0.002	0.927	0.407	0.717	-0.633	0.759	0.941	0.948	0.969	0.938	0.948	0.145	-0.180	0.964	0.926	0.841	1.000	0.930	0.975	0.958	0.929	0.849	0.954	0.902	-0.510	0.958	0.744	0.825	0.967	-0.088	0.969	0.795	0.665	0.974	0.248	0.918	0.953	0.718	0.943	0.851	0.770	0.954	0.968
KER.PA	0.922	0.971	0.931	0.930	0.179	0.974	0.633	0.619	-0.526	0.827	0.972	0.875	0.911	0.900	0.975	0.172	-0.183	0.970	0.858	0.902	0.930	1.000	0.937	0.980	0.955	0.905	0.881	0.947	-0.400	0.958	0.666	0.885	0.965	0.043	0.925	0.638	0.823	0.930	0.091	0.926	0.861	0.678	0.930	0.719	0.764	0.940	0.979
LR.PA	0.898	0.911	0.972	0.935	-0.077	0.921	0.395	0.620	-0.548	0.958	0.947	0.938	0.953	0.947	0.964	-0.155	-0.230	0.972	0.870	0.904	0.975	0.937	1.000	0.945	0.923	0.910	0.965	0.904	-0.532	0.962	0.790	0.846	0.971	0.618	0.946	0.768	0.765	0.869	0.125	0.931	0.941	0.683	0.944	0.804	0.802	0.927	0.954
MA	0.940	0.966	0.977	0.913	0.094	0.975	0.564	0.515	-0.564	0.935	0.970	0.885	0.941	0.897	0.976	-0.056	-0.255	0.980	0.840	0.913	0.958	0.980	0.945	1.000	0.961	0.875	0.880	0.960	-0.444	0.970	0.700	0.877	0.976	0.550	0.974	0.559	0.798	0.965	-0.069	0.923	0.887	0.603	0.941	0.665	0.800	0.956	0.996
MC.PA	0.984	0.954	0.945	0.878	0.082	0.949	0.321	0.641	-0.521	0.828	0.927	0.891	0.886	0.856	0.976	0.200	-0.161	0.975	0.828	0.797	0.929	0.955	0.923	0.961	1.000	0.802	0.863	0.984	-0.350	0.956	0.741	0.942	0.981	-0.022	0.953	0.659	0.709	0.936	0.022	0.857	0.865	0.730	0.976				

Appendix 4 : Markowitz graph



Appendix 5 : Second portfolio result

Tickers	Weights	Return	Risk	Sharpe ratio
NVDA	7%	64%	0,49	1,25
MSFT	3%	29%	0,28	0,95
AAPL	7%	25%	0,29	0,77
UNH	1%	22%	0,26	0,74
ADBE	18%	28%	0,33	0,75
MC.PA	11%	23%	0,28	0,73
AMZN	25%	27%	0,33	0,72
TSLA	12%	44%	0,57	0,72
MA	6%	21%	0,28	0,64
V	10%	19%	0,25	0,61
Total	100%	34%	0,38	0,81