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Big Data and Application on Pension Fund Investments

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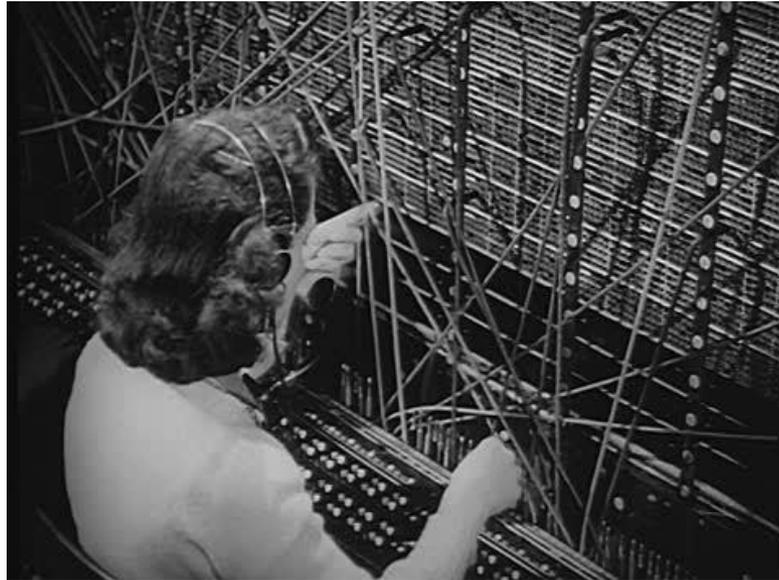
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Big Data and providers : lost in translation



BIG DATA : Disruption in the « real world »

- **Past** : From Data (storage: 5 Exabytes from prehistory to 2003)
- **Present** : Big Data : 5 Exabytes per day but 3.5% of data collected are really used
- **Future** : to Smart Data : smart cleaning, smart linking, smart thinking



BIG DATA: No disruption in Finance, just another way to focus on data !!

– Sixties

Beginning of index management on one hand... beginning of quantitative management on the other hand.

– Eighties/nineties,

Index management becomes « tilted » management on huge investment universe (DM & EM) relying on internal and/or external information system.

– Nineties and internet bubble,

Internet and data suppliers provide more and more (too much ?) information, but quality is degrading.

– 2003 -2007

Safe heaven for quantitative stock picking: clean financial information is transformed into relevant added value.

– 2008 schism

Absolute performance leads relative performance. Issue move from micro assessment to macro perspectives...

(Macro) Big Data 2008 – 2016 = (Micro) Big Data 80-90 ...

How Big Data are Applied

- **Satellite imagery and pattern analysis:** Objective insights from geospatial data, wireless network signaling data and pattern analysis.

Providers: RSMetrics, SpaceKnow, EidoSearch,, AirSage, Datascription

- **Events and Transactions:** Unstructured events and financial transaction data such as insider and M&A deals, for predictive analytics.

Providers: Capital IQ-Key events and Future events, Thomson reuters deal, Bloomberg, Capial IQ, 2iQ, Thomson reuters Activism, Wall Street Horizon, Thomson reuters News Analytics, RavenPack News Analytics, Factset Deal Analytics

- **Crowd Sourcing:** Harnessing the wisdom of the crowd through insights and emerging trends.

Providers: Estimote, Google Trends, Data Explorer (Marki)

- **New sentiment, Web mining and Social media:** Investor mood, sentiment and actionable ideas from web and social media platforms.

Providers: RavenPack News Analytics, Thomson reuters Newscope, Alexandria Technology, Newsquantified, Market prophet, LinkUp, Accern, Recorded Future, Alphasense, Benzinga

- **Macroeconomic Data:** A collection of global macroeconomic indicators and forecasts.

Providers: Haver, Bloomberg Economics, Datastream, Bluechip, Action Economics, FRED, World Bank data, OECD data, IMF country default import/export

Big Data and providers (DB research)

- **Multi-dimensional Data:** Supply chain linkage, investor ownership and analyst forecasts.

Providers: Thomson Reuters ownership, factset ownership, Caopital IQ ownership, Revere – Factset, Blommborg supply chain, Compustat supply chain, Bureau of Economic Analysis (BEA), Capital iQ supply chain, Thomson Reuters supply chain, IBES Detail

- **Cross Asset:** Fixed income and options data, global fund flow and hedge fund performance.

Providers: Hedge fund research (HFR), DB eDerivatives database, OptionMetrics, Fixed Income Database (DBIQ), EPFR, Morningstar Funf flow data, Liper Fund fund flow data

- **Industry specific:** Integrating the fundamental views in quantitative models.

Providers: Capital IQ Industry specific SNL, Reuters Industry Data, Compustat Industry Specific, Compustat Bank & Thrift, Compustat bank regulatory

Multi-dimensional Data: Supply chain linkage, investor ownership and analyst forecasts

- **High Frequency:** Tick by Tick data for low latency traders and traditional investors.

Providers: TAQ – KDB Tick database (NYSE feed), Reuters data feed, Bloomberg, Ablemarkets, One Tick

- **Accounting and Socially Responsible Investing:** Sustainable, responsible and impact investing (SRI), through the environmental, social, governance (ESG) criteria

Providers: MSCI ESG, GMI, AGR & AAER, Trucost Environmental Data, Thomson reuters Asset4, Bloomberg ESG (Bcause), BizQualify (Labor force)

Implication of Big Data in Quant Equity

- **Value of the data:**

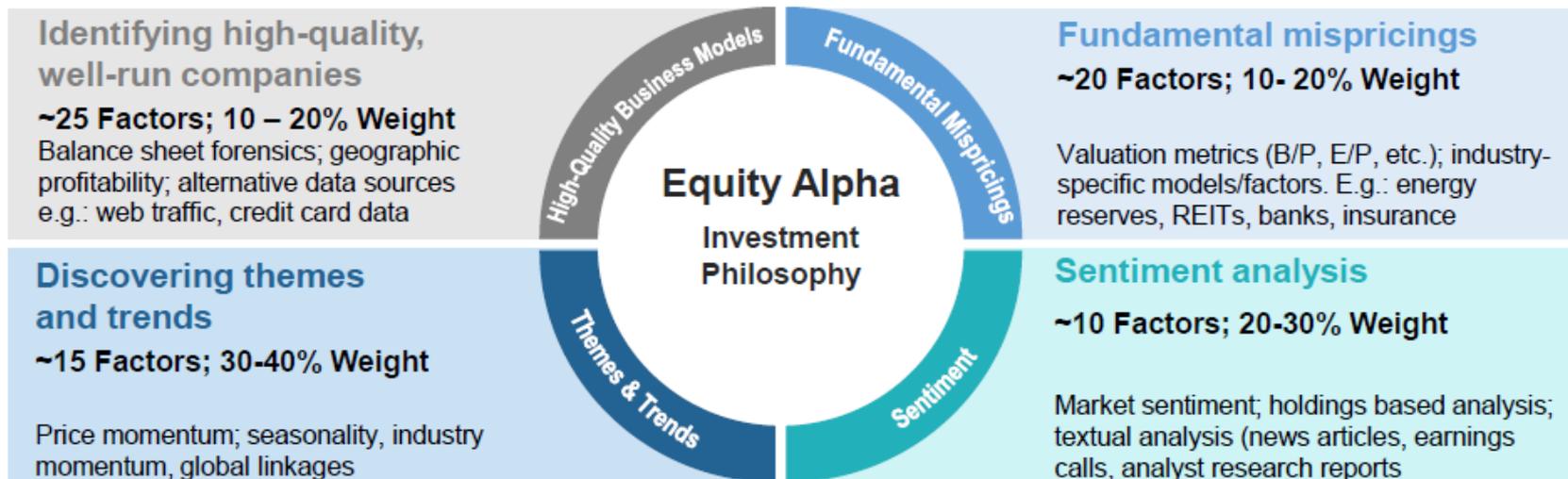
- Data means information
- Data may have a cost
- Data may be sensitive or strategic
- Data may be confidential

- Smart beta and factor investing are two examples of how big data is transforming the investment landscape

The power of data and machine learning in asset management : J Rodriguez-Alarcon

Equity Alpha Investment Pillars

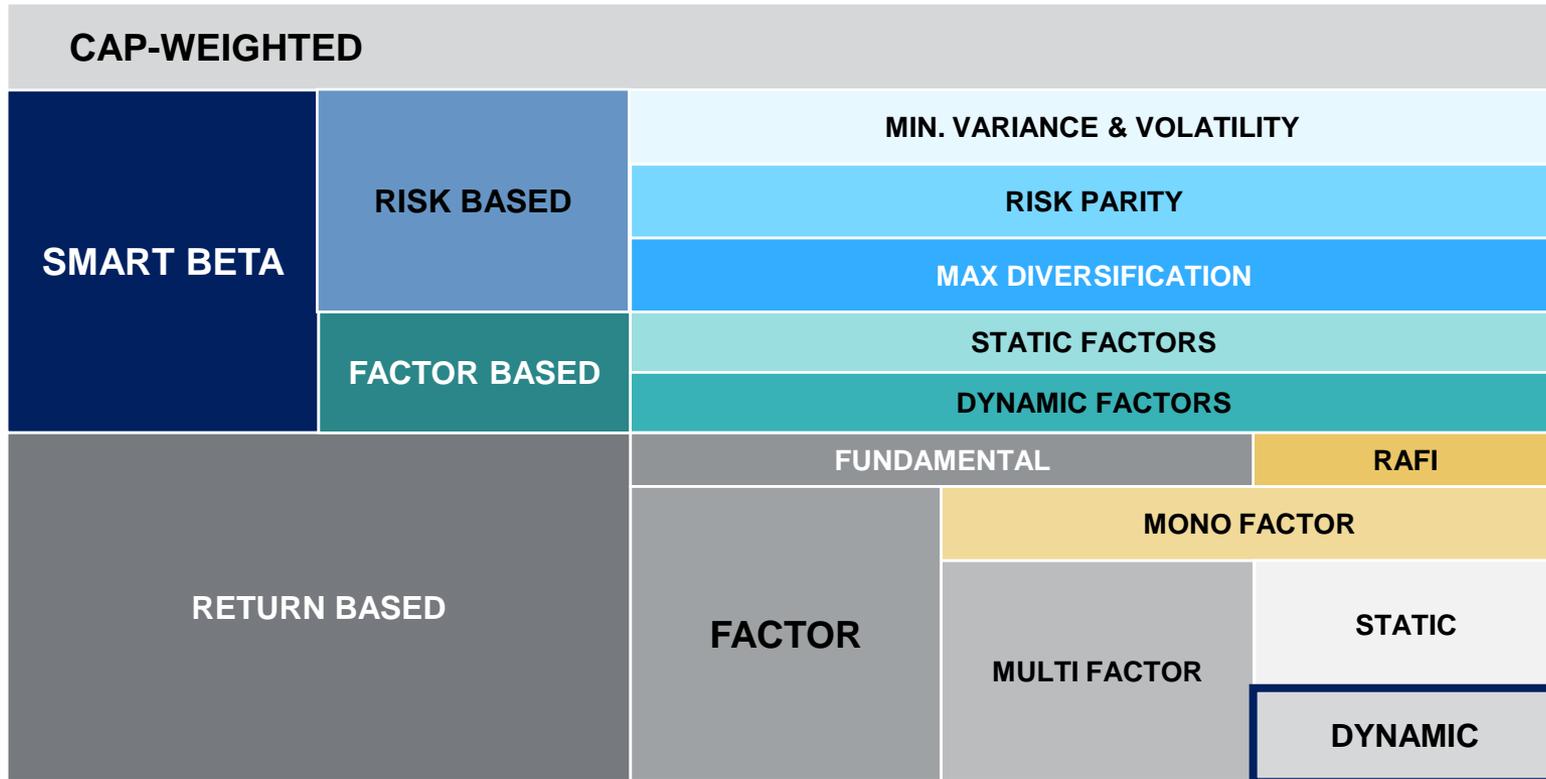
Discovering Investment opportunities through data-driven analysis



A disciplined data-driven approach can uncover investment opportunities

Number of factors and weights are shown as of June 30, 2017. There is no guarantee that these objectives will be met.

Factor Investing Mapping



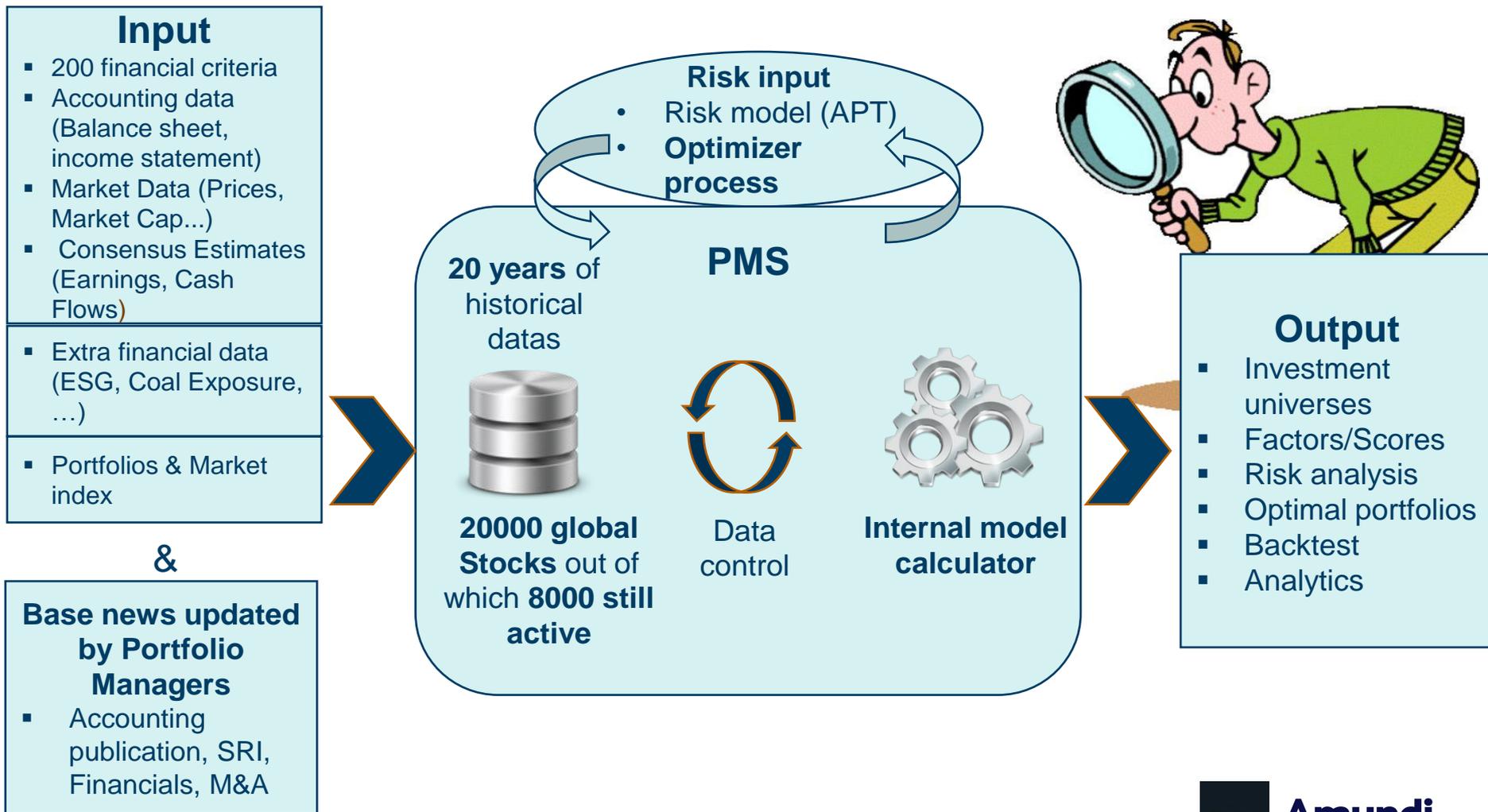
A quant stock-picking approach capturing performance through “return” factor combination according to market regime

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Big Data at CPR AM in PMS (In- house quantitative research tool)



Big Data at CPR AM in PMS - Global Map



Big Data at CPR AM in PMS - Coverage

- 8000 alive stocks
- Developed markets
- Emerging markets
- All sectors, industries and countries... with financial criteria updated on a daily basis and risk items updated on a monthly basis

ID	Isin	Sedol	Libellé	Devises	Cotation	Secteur Gics - Niv 4	ABF005 (122) 04/10/17	Msci EMU (241) 04/10/17	Arcco Quant 1 (109) 04/10/17	Euroland vif (127) 04/10/17	EuroSb200 (300) 04/10/17	Apoline (136) 04/10/17	Momentum 04/10/17	Diffusion 04/10/17	Earning Momentum 04/10/17	Earning Trend 04/10/17	Alpha Blend Neutre 5/R 04/10/17
1	FR0000120404	5852842	Accor SA	EUR	Paris-Sbf	Hotels Resorts & Cruise Lines	-0.192%	0%	-0.192%	-0.192%	0.011%	0.462%	-0.761	-0.539	-1.207	-1.874	-1.659
6	FR0000120073	B1YXBJ7	Air Liquide	EUR	Paris-Sbf	Industrial Gases	-0.192%	0%	-0.186%	-0.028%	-0.059%	-0.682%	-0.514	-0.983	-0.809	-0.634	-0.825
7	FR0013281847	BF99RQ7	Bolloré	EUR	Paris-Sbf	Multi-Sector Holdings	-0.09%	0%	-0.09%	-0.09%	-0.003%	-0.09%	-0.046	-0.364	-0.616	-0.867	-0.997
11	DE0005YM9999	B1B4K8	Symrise Ag	EUR	Xetra (Frankfu...	Specialty Chemicals	-0.197%	0%	-0.197%	-0.197%	-0.012%	-0.197%	-0.773	-1.193	-0.658	-0.124	-1.604
13	FR0010220475	80D38Q5	Alstom	EUR	Paris-Sbf	Construction & Farm Machinery & H...	-0.137%	0%	-0.137%	-0.137%	-0.004%	-0.137%	0.321	-0.271	-0.406	-0.541	-0.747
22	FR0000051732	5654781	Atos Origin Sa	EUR	Paris-Sbf	IT Consulting & Other Services	0.462%	0%	0.481%	0.515%	-0.022%	-0.001%	0.4	-0.245	-0.2	-0.155	0.499
23	FR0000120628	7088429	AXA SA	EUR	Paris-Sbf	Multi-line Insurance	0.569%	0%	0.538%	0.579%	0.021%	-0.517%	0.468	0.668	0.305	-0.058	0.504
28	FR0000121147	4400446	Faurecia	EUR	Paris-Sbf	Auto Parts & Equipment	0%	0%	0%	0%	0.104%	0%	1.403	1.252	1.002	0.752	-0.291
30	FR0000120966	5298781	Société BIC SA	EUR	Paris-Sbf	Office Services & Supplies	-0.065%	0%	-0.065%	-0.065%	-0.007%	-0.065%	-1.544	-1.635	-1.24	-0.845	0.403
32	FR0000131104	7309681	Bnp Paribas	EUR	Paris-Sbf	Diversified Banks	0.274%	0%	0.304%	0.171%	-0.049%	0.048%	0.807	1.011	0.538	0.065	0.407
36	FR0000120503	4002121	Bouygues	EUR	Paris-Sbf	Construction & Engineering	-0.213%	0%	-0.213%	-0.213%	0.058%	0.352%	0.446	0.4	0.16	-0.081	-0.493
46	FR0000125338	4163437	Cap Gemini Sa	EUR	Paris-Sbf	IT Consulting & Other Services	-0.397%	0%	-0.397%	0.121%	0%	0.321%	-0.12	-0.223	-0.148	-0.072	0.487
49	FR0000120172	5641567	Carrefour Sa	EUR	Paris-Sbf	Hypermarkets & Super Centers	-0.003%	0%	0.008%	0.009%	0.008%	0.25%	-2.378	-2.457	-2.107	-1.757	0
50	FR0000125585	4178419	Casino Guichard Perrac...	EUR	Paris-Sbf	Food Retail	0.311%	0%	0.322%	0.259%	-0.004%	0.331%	-0.782	-0.947	-1.033	-1.119	0.697
69	DE0005501357	4647317	Axel Springer AG	EUR	Xetra (Frankfu...	Publishing	-0.067%	0%	-0.067%	-0.067%	-0.002%	-0.067%	0.25	0.138	0.266	0.392	-1.014
81	FR0000120644	B19YTB3	Danone SA	EUR	Paris-Sbf	Packaged Foods & Meats	-0.012%	0%	0.59%	0.181%	0.005%	-0.993%	-0.74	-0.859	-0.605	-0.352	-0.416
82	FR0000121725	4067164	Dassault Aviation Sa	EUR	Paris-Sbf	Aerospace & Defense	-0.085%	0%	-0.085%	-0.085%	-0.009%	-0.085%	-0.033	-1.082	-0.787	-0.493	-0.912
84	FR0000130650	5330047	Dassault Systemes Sa	EUR	Paris-Sbf	Application Software	-0.279%	0%	-0.279%	-0.279%	0%	-0.279%	-0.523	-1.333	-0.863	-0.392	-0.593
96	FR0000130452	B13X013	Effage	EUR	Paris-Sbf	Construction & Engineering	0.642%	0%	0.675%	0.637%	0.043%	1.11%	0.888	1.239	0.921	0.603	-0.459
104	FR0000121667	7212477	Essilor International	EUR	Paris-Sbf	Health Care Supplies	-0.547%	0%	0.612%	-0.547%	-0.001%	-0.547%	-1.314	-2.033	-1.418	-0.804	-0.268
107	FR0000121121	7042395	Eurazeo	EUR	Paris-Sbf	Multi-Sector Holdings	-0.083%	0%	-0.484%	-0.083%	-0.006%	-0.083%	1.667	1.698	1.665	1.633	0.018
109	FR00000038259	5972643	Eurofins Scientific	EUR	Paris-Sbf	Life Sciences Tools & Services	-0.149%	0%	-0.149%	-0.149%	-0.013%	-0.149%	0.814	1.036	0.984	0.933	-1.065
129	FR0000133308	5176177	Orange (FR Listing)	EUR	Paris-Sbf	Integrated Telecommunication Servi...	0.562%	0%	0.549%	0.034%	-0.032%	0.022%	-0.549	-0.335	-0.337	-0.339	0.867
132	FR0010040865	7742468	Geacna Sa	EUR	Paris-Sbf	Diversified REITs	-0.159%	0%	-0.159%	-0.159%	-0.011%	-0.159%	0.241	1.048	1.045	1.041	-0.551
156	FR0000052292	5253973	Hermès International	EUR	Paris-Sbf	Apparel, Accessories & Luxury Goods	-0.332%	0%	-0.332%	0.065%	-0.042%	-0.332%	-0.494	-1.567	-1.133	-0.7	-1.901
165	FR0000120859	8011GL4	Imerys Sa	EUR	Paris-Sbf	Construction Materials	0.466%	0%	0.535%	0.601%	-0.009%	0.862%	-0.443	-0.922	-0.795	-0.669	-0.946
175	FR0000125346	4195897	Ingenico	EUR	Paris-Sbf	Electronic Equipment Manufacturers	-0.115%	0%	-0.115%	-0.115%	-0.005%	-0.115%	0.025	0.136	0.212	0.288	0.401
183	FR0000121964	7582556	Klepierre	EUR	Paris-Sbf	Retail REITs	-0.179%	0%	-0.179%	-0.179%	-0.019%	-0.179%	-0.658	0.949	0.175	-0.599	0.749
184	FR0000120321	4057808	L'oreal	EUR	Paris-Sbf	Personal Products	-0.309%	0%	-0.22%	0.02%	-0.09%	-1.126%	-1.132	-2.476	-1.625	-0.774	-0.798
189	FR0000130213	4547213	Lagardere S.C.A.	EUR	Paris-Sbf	Publishing	-0.082%	0%	-0.082%	-0.082%	-0.014%	-0.082%	0.038	-0.28	-0.204	-0.127	-0.106
195	FR0000065484	4508663	Lectra	EUR	Paris-Sbf	Application Software	0%	0%	0%	0%	0%	0.41%	0.224	-1.064	-0.785	-0.465	-0.247
203	FR0000121014	4061412	Lvmh Moët Hennessy ...	EUR	Paris-Sbf	Apparel, Accessories & Luxury Goods	0.248%	0%	0.301%	0.246%	-0.125%	0.43%	0.581	0.094	0.063	0.032	-0.558
209	FR0000121204	7390113	Wendel	EUR	Paris-Sbf	Multi-Sector Holdings	-0.097%	0%	-0.097%	-0.097%	0%	-0.097%				1.4	-2.019
216	FR0000121261	4588364	Compagnie Generale de...	EUR	Paris-Sbf	Tires & Rubber	-0.122%	0%	0.267%	0.007%	0%	0.306%	0.305	-0.272	-0.113	0.046	-0.84
223	FR0000120685	B1HDJL2	Natixis	EUR	Paris-Sbf	Diversified Banks	-0.161%	0%	-0.161%	-0.161%	-0.014%	-0.161%	1.617	2.176	1.56	0.943	-0.843
235	FR0000120693	4682329	Pernod-Ricard Sa	EUR	Paris-Sbf	Distillers & Vintners	-0.627%	0%	-0.627%	-0.627%	-0.043%	-0.627%	-1.238	-2.661	-1.842	-1.022	-0.648
236	FR0000121501	7103526	Peugeot Sa	EUR	Paris-Sbf	Automobile Manufacturers	0.092%	0%	0.078%	0.033%	0.009%	-0.266%	1.066	1.037	0.824	0.612	0.566
238	FR0000121485	5505072	Kering (FR Listing)	EUR	Paris-Sbf	Apparel, Accessories & Luxury Goods	0.754%	0%	0.538%	0.011%	-0.078%	-0.639%	1.471	1.457	0.928	0.398	-0.465
239	FR0000124570	B08V9H4	Plastic Omnium	EUR	Paris-Sbf	Auto Parts & Equipment	0%	0%	0%	0%	0.057%	0.062%	0.462	0.809	0.476	0.143	0.33
245	FR0000130577	4380429	Publicis Groupe	EUR	Paris-Sbf	Advertising	0.184%	0%	0.196%	0.17%	-0.002%	-0.304%	-1.242	-1.198	-0.993	-0.788	0.09
350							0%	0%	0%	0%	0%	0%	0.1	-0.08	-0.06	-0.05	0.06

Big Data at CPR AM in PMS - In-House base News

Restaurants Profils Base News IC Analyzer Market Timing Fiche Structure Portefeuilles calculés Univers Agrégats Formules

Outils Ressources

Ouvrir Backtest x ABF005 - 04/10/2017 x IC Analyzer x Base News x

Periode 05/09/2017 05/10/2017

Date	Perf ...	Code ISIN	Libellé	Important	Note	Commentaire	Auteur	Région	Pays	Secteur	Libell...	Categorie	File J...	Broker	Source
05/10/...		FR001024...	Electricité De France			Edison (Groupe EDF) et 3 R...	labbe	EURP	FR	5510	Utilites	Communi...			CIC
05/10/...		ES011687...	Gas Natural Sdg Sa			A reconnu être en train de n...	labbe	EURP	ES	5510	Utilites	Restruct...			Societe generale
05/10/...		FR000012...	Vivendi			Bureaux perquisitionnés par ...	labbe	EURP	FR	5010	Telec...	Juridique...			Exane
05/10/...		GB005982...	Dialog Semiconductor Plc			annonce l'acquisition de l'am...	canard	EURP	DE	4530	Semic...	Communi...			Autres
05/10/...		FR000005...	Atos Origin Sa		+	a annoncé mercredi l'acquist...	labbe	EURP	FR	4512	IT Co...	MBA			Kepler
05/10/...		FR000005...	Ubssoft Entertainment		+	a annoncé hier le lancement ...	labbe	EURP	FR	4511	Soft...	Communi...			Kepler
05/10/...		DE000412...	Scout24 AG			Helman&Friedman a cédé 1...	labbe	EURP	DE	4511	Soft...	Communi...			Kepler
05/10/...		FR000012...	Eurazeo		+	a annoncé son intention de ...	labbe	EURP	FR	4012	Specd...	Communi...			Kepler
05/10/...		IT0000510...	Banca Carige Spa			Les autorités de supervision ...	canard	EURP	IT	4011	Banks...	Juridique...			CIC
05/10/...		FR000012...	Natixis			Bureaux perquisitionnés par ...	labbe	EURP	FR	4011	Banks...	Juridique...			Exane
05/10/...		FR001127...	Fermentalg SA			AUGMENTATION DE CAPITA...	labbe	EURP	FR	3521	Biote...	Communi...			Gilbert Dupont
05/10/...		CH000900...	Barry Callebaut Ag-reg			Barry Callebaut a finalisé l'ac...	labbe	EURP	CH	3020	Food...	MBA			Kepler
05/10/...		JE00089K...	Wpp Plc		-	La bataille pour Asatsu DK, ...	labbe	EURP	GB	2541	Media...	MBA			Kepler
05/10/...		FR000012...	Accor SA		+	a annoncé un accord avec la...	labbe	EURP	FR	2530	Hotel...	Communi...			Kepler
05/10/...		FR001243...	Els SA			Eurazeo a annoncé son inte...	labbe	EURP	FR	2021	Com...	Communi...			Kepler
05/10/...		DE000723...	Siemens AG		+	a annoncé la cession de sa p...	labbe	EURP	DE	2013	Capit...	Communi...			Kepler
05/10/...		CH000081...	Oc Oerlikon Corp Ag-reg			Oerlikon rachète Primatec...	labbe	EURP	CH	2013	Capit...	MBA			Kepler
05/10/...		ES014341...	Gamesa Corp Tecnolog...		-	Les prix de l'énergie éolien...	labbe	EURP	ES	2013	Capit...	Communi...			Societe generale
05/10/...		FR001030...	Legrand SA			A lancé une émission obligat...	labbe	EURP	FR	2012	Capit...	Dette			Societe generale
05/10/...		DE0000ED...	Osram Licht AG			placement de 18.15m de titr...	labbe	EURP	DE	2012	Capit...	Communi...			Kepler
05/10/...		FR000012...	Dassault Aviation Sa			La France n'aurait pas renon...	canard	EURP	FR	2011	Capit...	Communi...			Kepler
05/10/...		NL000023...	Airbus Group NV			a dit aux Etats européens a...	labbe	EURP	FR	2011	Capit...	Communi...			Kepler
05/10/...		FR001275...	SPIE SA			annonce la signature d'un co...	labbe	EURP	FR	1512	Mater...	Communi...			Gilbert Dupont
05/10/...		BE000347...	Solvay Sa			Solvay accroît sa production...	labbe	EURP	BE	1511	Mater...	Communi...			Kepler
05/10/...		FR000012...	TOTAL S.A.			Total cherche à développer l...	labbe	EURP	FR	1010	Energy	Communi...			Kepler
04/10/...	1.96 %	FR001326...	Rubis			annonce le rachat auprès de...	canard	EURP	FR	5510	Utilites	MBA			CIC
04/10/...	-5.47 %	IT0000349...	Telecom Italia Spa			: 1/Le président de la Cassa ...	canard	EURP	IT	5010	Telec...	Communi...			CIC
04/10/...	2.14 %	FR000012...	Vivendi			: 1/Le président de la Cassa ...	canard	EURP	FR	5010	Telec...	Communi...			Autres
04/10/...	-1.37 %	SE000010...	LM Ericsson Telefon AB...			Sa filiale espagnole serait en...	canard	EURP	SE	4521	Com...	Communi...			Autres
04/10/...	-0.85 %	FR000411...	Esi Group			annonce le lancement de la ...	labbe	EURP	FR	4511	Soft...	Communi...			Gilbert Dupont

Input News

Date: 05/10/2017 Instrument: Airbus Group NV Edit

Categorie: Communication financière Secteur: Capital Goods - Aerospace Insert

Important Region: Europe Pays: France Save

Note: Neutre Auteur: labbe Cancel

Broker Source: Kepler joindre fichier Delete

Commentaire: a dit aux Etats européens avoir pris la décision stratégique de réinternaliser la conception de certains travaux sur le carénage moteurs plutôt que de continuer à la confier à certains fournisseurs, il n'en sur une présentation disponible sur le site internet de l'avionneur européen.

Instrument detail

Date	Auteur	Commentaire
05/10/2017	labbe	a dit aux Etats européens avoir pris la décision stratégique de réinternaliser la conception de certains travaux sur le carénage moteurs plutôt que de continuer à la confier à certains fournisseurs, il n'en sur une présentation disponible sur le site internet de l'avionneur européen.
02/10/2017	labbe	Un super jumbo A380 d'Air France, qui assurait la liaison Paris-Los Angeles, a dû se poser en urgence au Canada en raison d'une importante panne sur l'un de ses moteurs, sans dommages pour ses 520 occupants.
28/09/2017	canard	SriLankan Airlines devrait abandonner une seconde commande d'A350.
20/09/2017	labbe	a ouvert mercredi en Chine un centre de finition pour gros porteurs A330: un nouvel argument de vente pour l'avionneur européen, qui dispute à Boeing son rival Boeing un marché chinois à l'insolente croissance.
18/09/2017	canard	Le Qatar a signé une lettre d'intention pour 24 Typhoon à Eurofighter
18/09/2017	herent	lance une nouvelle enquête interne après des révélations du Guardian sur une transaction douteuse de 19 M€
14/09/2017	labbe	Cathay Pacific a annoncé mercredi son intention de reporter d'un an les livraisons de six gros porteurs Airbus (A350-1000) qu'elle devait recevoir en 2020 et le remplacement d'une commande de six autres appareils (A350-1000) par de plus petits modèles (A350-900) afin de réduire ses coûts. En revanche, la compagnie a finalisé la commande de 32 avions A321neo (la signature d'un protocole d'accord non contraignant annoncé le 21/08 au prix catalogue de 3.394Mds\$). Ces appareils seront livrés en 2019 et 2020.
08/09/2017	labbe	La plus grande compagnie aérienne long-courrier du monde, Emirates tient à obtenir des assurances sur l'avenir du programme A380 d'Airbus avant de passer une commande de 8Mds\$ pour plus d'appareils à deux étages. Alors qu'Airbus milite en faveur d'un accord au salon de l'aviation de novembre à Dubaï, le président de la compagnie aérienne Tim Clark affiche une réticence en raison de la crainte que la valeur des A380 usagés pouvait chuter rapidement à cause d'un succès mou rencontré par le modèle (non accélération de rythme des ventes de l'A380) ainsi que le prix proposé. Airbus avait annoncé en juillet qu'il réduirait la production de huit l'A380 en 2019, contre 15 en 2017 et 28 en 2016.
01/09/2017	labbe	A la suite de la revue annuelle portant sur la composition de ses indices, Deutsche Börse a fait savoir hier soir que le groupe aéronautique européen Airbus remplacerait le britannique BT au sein de l'indice Stoxx Europe 50, ce changement étant effectif à l'ouverture de la séance du 18 septembre prochain.
25/08/2017	labbe	Qantas devrait annoncer ce vendredi un programme de réaménagement intérieur de sa flotte d'Airbus A380. La compagnie australienne, qui exploite aujourd'hui 12 super Jumbos, a décidé d'investir dans l'A380. De plus, plus la compagnie envisage le lancement de vols d'une durée de 20 heures à partir de 2022 qui lui permettraient de relier Sydney à l'Europe sans escale.
07/08/2017	canard	A reçu 4 commandes d'avions (3 A320-200 et 1 A350-1000) et livré 47 appareils en juillet. Sur les sept premiers mois de 2017, Airbus a reçu 205 commandes nettes d'avions et a livré 353 appareils. Dow Jones
27/07/2017	labbe	Commandes S1 €37.2Mds, CA S1 €28.71Mds, T2 €15.7Mds vs Cons €15.97Mds, Ebit ajusté T2 €859M vs Cons €77.6M, livraison de 8 A380 en 2019 et le groupe confirme ses guidances FY17.
07/07/2017	canard	Qatar Airways a annulé quatre commandes d'A350-900 en raison des délais de livraisons et ces appareils seront remplacés.

Big Data at CPR AM in PMS - Backtest of multi-factor Strategy

Backtests

Drag a column header here to group by that column

C...	Libelle
0	Univers "OPT MSCI Europe" en Optimisation...
1	Univers "OPT MSCI Europe" en Optimisation...
2	Univers "OPT MSCI Europe" en Optimisation...
3	Univers "OPT MSCI Europe" en Optimisation...

Backtest - Paramètres

Univers: OPT MSCI Europe | Quantiles: 1

Mode de Construction: Optimisation APT | Rebalancement: Mensuel | Fin de periode:

Tilt: | Valorisation: Quotidie | Price Index:

Benchmark: Indice | Choix Indice: Msci Europe | Choix Backtest: 3 - defto

Alpha(s): Alpha: | Normalisation: | Création alpha composite

Formule Alpha Composite:

Dates et Sauvegardes: Date Début: 30/12/2005 | Data Fin: 31/08/2017

Libellés et Sauvegardes: Libellé Backtest: Univers "OPT MSCI Europe" en Optimisation APT du 30/12/2005 au 31/08/2017 (R) | Libellé Court (Sans Carac. Spéc): blendto2 | Enregistrer Sous: C:\Personal_Unsa...

Ecrire directement dans un fichier

Sortie Unique

Afficher | Check | Effacer Tout

Recalculer | Ouvrir | Sauvegarder

Ajouter à la liste des backtest | Modifier

Univers "OPT MSCI Europe" en Optimisation APT du 30/12/2005 au 31/08/2017 (R=Monthly)

Quantile: Q1 - Univers "OPT MSCI Europe" en Optimisation APT du 30/12/2005 au 31/08/2017 (R=Monthly)

Performances & Turnover

Univers "OPT MSCI Europe" en Optimisation APT du 30/12/2005 au 31/08/2017 (R=Monthly)

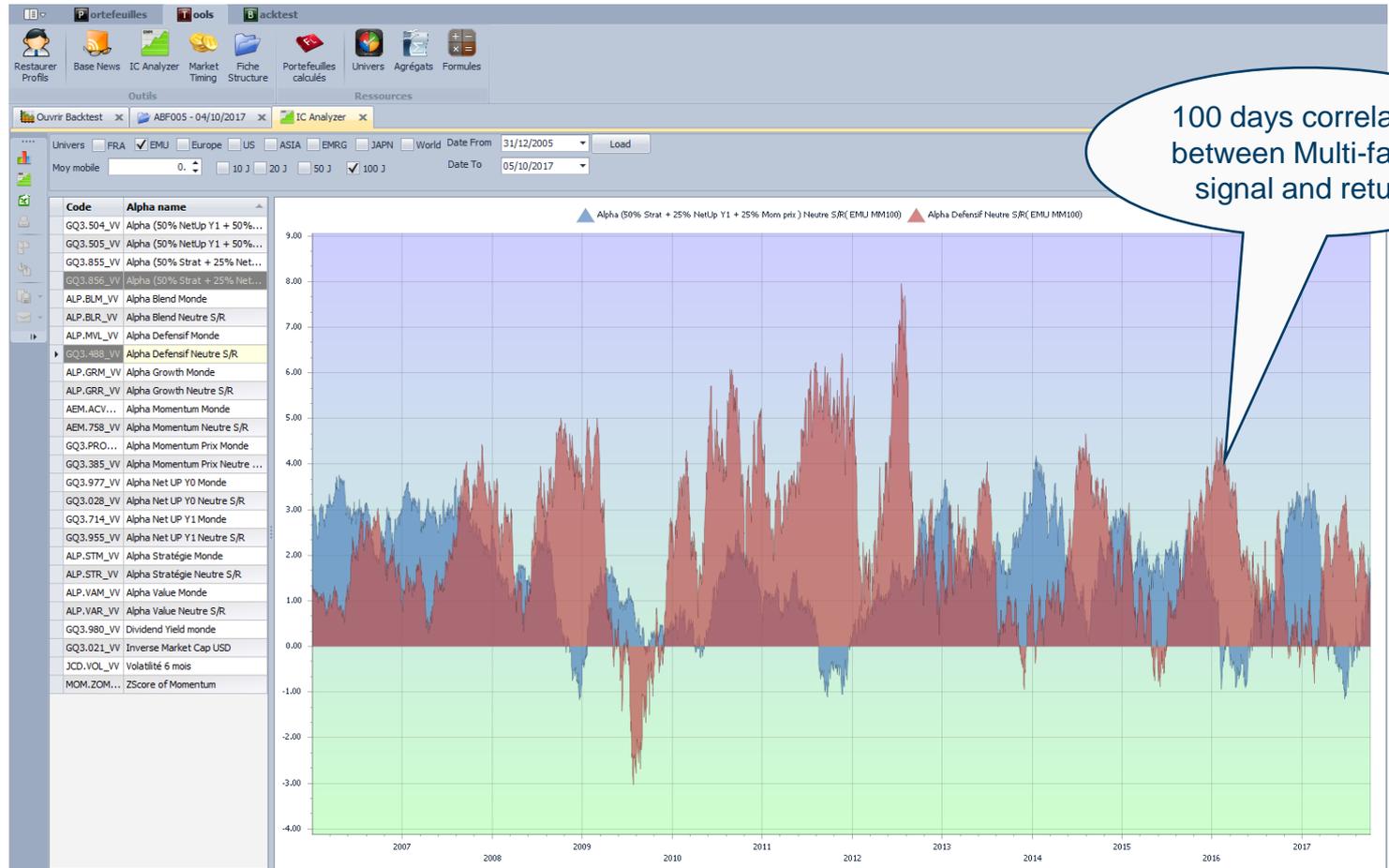
Valueur

	Portfeuille	Quantile
	BNC - Msci E...	PTF - defto
DataType	Q1	Q1
Performance An...	1.55 %	4.69 %
Performance Glo...	19.65 %	70.77 %
Ratio d'informa...	0.00 %	104.50 %
Tracking Error a...	0.00 %	3.03 %
Turnover A/N M...	1.03 %	19.71 %

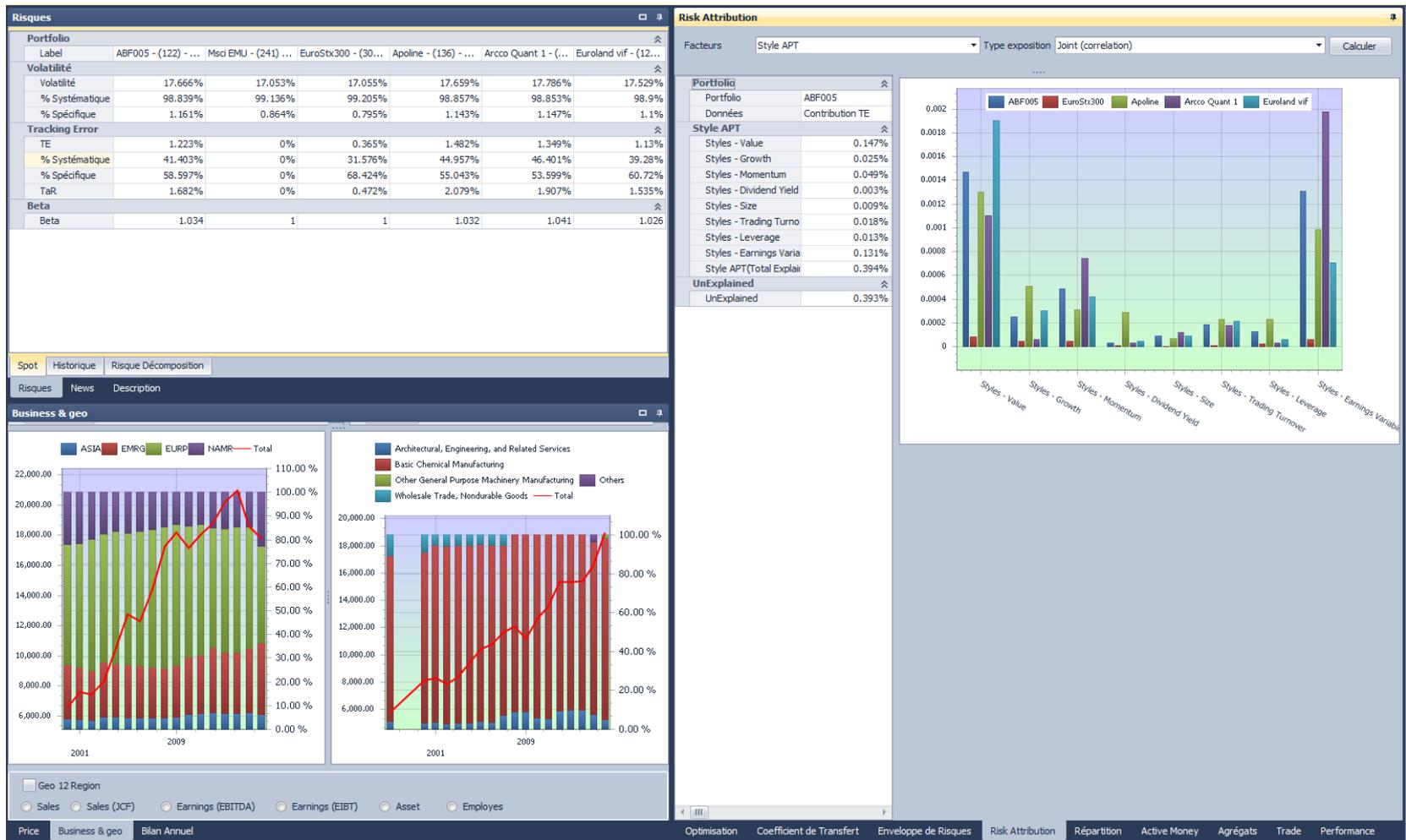
Perf

	Portfeuille	Quantile
	BNC - Msci E...	PTF - defto
Année	Q1	Q1
2006	19.46 %	19.59 %
2007	0.48 %	0.04 %
2008	-45.08 %	-41.89 %
2009	26.83 %	26.88 %
2010	8.11 %	14.55 %
2011	-10.97 %	-7.82 %
2012	13.64 %	19.04 %
2013	16.62 %	20.83 %
2014	3.82 %	8.80 %
2015	6.11 %	10.07 %
2016	-0.55 %	4.88 %
2017	2.42 %	1.48 %

Big Data at CPR AM in PMS - Information Coefficient on Multi-factor Strategy

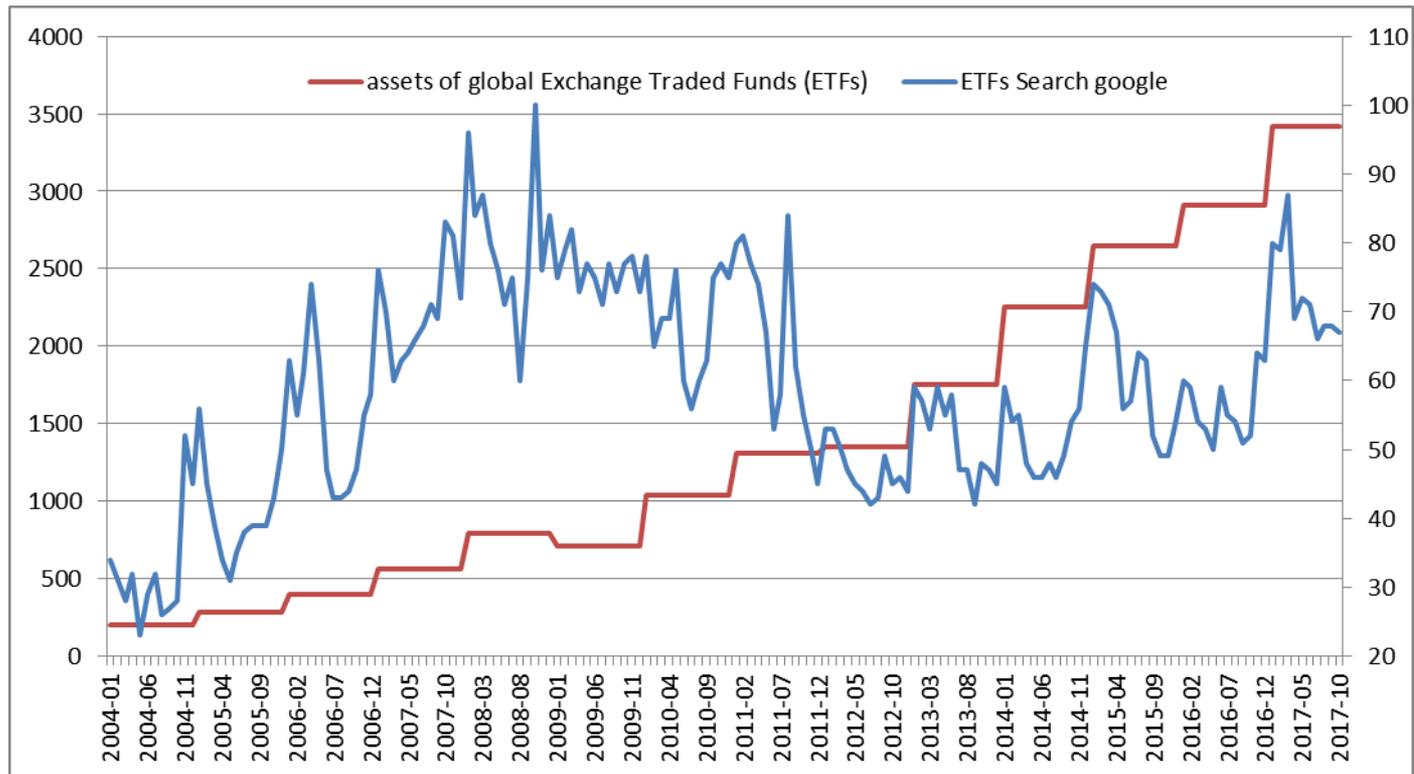


Big Data at CPR AM in PMS - Risk Tools



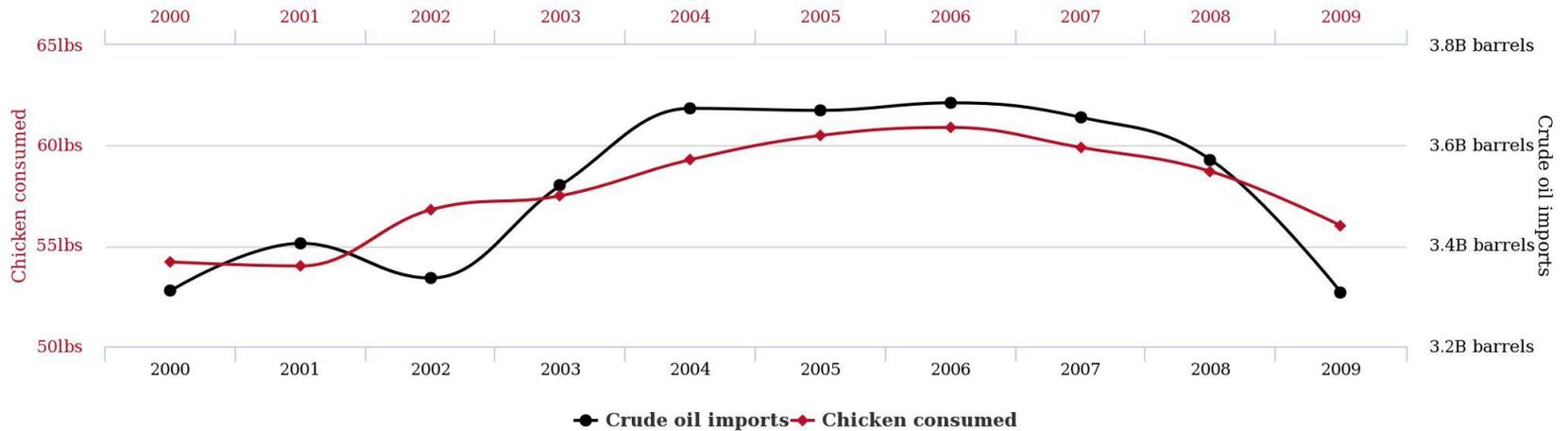
Warning: Big Data and finance : Qualitative in quantitative

— Is the best search engine in the world relevant for forward looking ?



Warning: Be careful with the « meaningless » correlation of data

Per capita consumption of chicken correlates with Total US crude oil imports

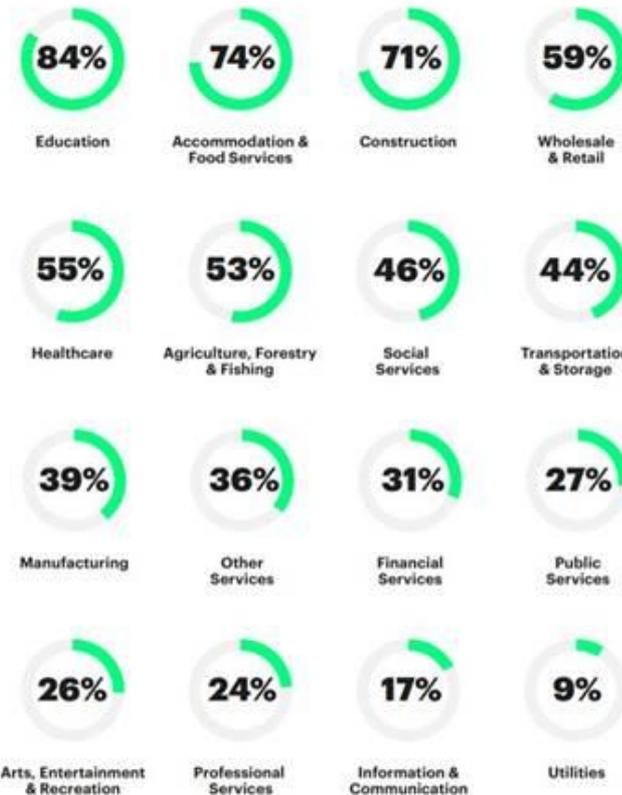


tylervigen.com

Warning: AI is already relevant in corporate earnings (not a yesterday story, a current story)

Figure 6. The impact of AI on profits by industry

Share-of-profit increase per industry between baseline in 2035 and AI steady state in 2035 (%)



Source: Accenture and Frontier Economics

Q&A: BIG DATA in the Equity Investment Process

Q: Big Data diffusion and its impact on equity investment process ?

A: No disruption, just on-going business. But questions are numerous: which kind of data ? (Data means information, Data may have a cost, Data may be sensitive or strategic, Data may be confidential).

Q: What are the detailed impact of Big Data in each step of the Investment Process

A: **BIG DATA is effective everywhere and increases the « take into account » speed of financial and non financial information, the weight of AI depends on systematic part of the investment process:**

- Expected return assessment: Corporate analysis / research.
 - Operational research – neural network - Robot advisors: asset allocation advisory - Google trend (text analysis as for Fed's comment or corporate reports).
- Portfolio construction: risk model (variance/covariance matrix estimate: BARRA or APT (Aptimum) or Axioma etc...) address the demand correctly.
- Trading: more and more smart algorithms to enhance trading quality and relevance. These algorithms are AI. High frequency trading (submarine cable to win 3 milliseconds by operation).
- In asset allocation advisory: robot advisors are more and more present.

Q&A on BIG DATA in Equity Investment Process

Q: Which kind of Asset Manager invest in BIG DATA and AI ? PM's profile evolution ?

A: Active managers (not passive). With an impact on portfolio managers' profile: a mix combination of economic, financial analysis, mathematical and data processing expertise. We follow 8000 stocks through accounts, markets and consensus data on a daily basis. We rely on multi profile PM gathered by SFAF and CFA.

Q: Is the Future closer to enhanced PM or equity management without PM ?

A: We provide « expertise driven equity quantitative management » or « Multi-factor equity management ». PM have developed models , know their limits and are able to take the lead each time it is necessary. You cannot put everything in one model !!

However, Smart beta and factor investing are two examples of how big data is transforming the investment landscape and AI takes « step by step » human intelligence's place to exploit Big Data.

Internet didn't kill books, Big Data won't kill PMs but will impact more and more their tools and profiles !!

Key messages from the European Quantitative Investing Conference: Big Data and AI in Finance (GS september 14th 2017)

- There is a **LITTLE** alpha in structured data (numbers), but there is a **BIG** alpha in non-structured data (voice, text, video)
- Impact of **BIG DATA** in investment process: Big Data talks to quants and fundamental PM, and may be more to fundamental PM. **Ideas will always be different from technics and details, mainly when clients understand PM's ideas**
- Natural Language Processing enhanced company search, avoiding usual traps such as double speaking, text written by a person not knowing anything about the subject, identifying the exposure of the company to the topic. It allows Quants to become more fundamental and fundamental to become more systematic. **What about text written by machine ? More and more a reality in financial (Bloomberg) and classical news (Washington Post)**
- **Machine learning and AI are better for risk based approach than for alpha detection due to subjectivity of selection.**
- **Only DATA matters, the rest is technic and time.**
- **Transparency (in methodology used to create value with data) is mainly helpful but sometimes it may cause harm**
- **3 researchers “PM in finance” and 1 researcher “in real life”. Researcher/PMs explain with a lot of details their skill and expertise and conclude after all that human is the key of the process. Researcher (real life) explains that algorithm do better than human in average (GO, Check, decision without emotion during crisis, etc...).** Example given by the moderator: you put your music selected lists in Spotify and sometimes you let the program choose music and... it's good, you discover new songs, like them and include them in your selected list...
- **90% of the added value is DATA storing and cleaning, the boring business is more important that the funny business of machine learning development (true for equity management too !!)**

Conclusion

- **BIG DATA in finance is not a disruption but a combination of more data and new skills exploiting these data.**
 - 90% of the added value is DATA storing and cleaning, the boring business is more important than the funny business of machine learning development.
 - Only DATA matters, rest is technic and time, so PROTECT DATA.
- **AI's impact depends on investment process' systematic part.**
 - AI is already able to replace human in decision making process but how communicate on “shadow decision”.
 - Deep nets are amazing but they do not see like us and think like us... so transfer of client's confidence to PM or to AI is the key point...
- **CPR AM (Quant boutique in Amundi Group)** is able to customize “tailor made investment solutions” with its micro-BIG DATA (PMS) framework and its Multi-factor approach for both absolute and relative performance offers.

AI AND BIG DATA: THEIR IMPACT ON EQUITY INVESTMENT OFFER FOR PENSION FUND

Appendix

Summary

What is BIG DATA ?

- Storage, cleaning and exploitation of huge quantity of data

What is Artificial Intelligence ?

- AI means a computer is able to take a decision to solve a problem without being explicitly programmed for that.
- a) is an area of computer science that deals with giving machines the ability to seem like they have human intelligence.
- b) is the simulation of human intelligence processes by machines, especially computer systems
- c) the power of a machine to copy intelligent human behavior
- d) the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings

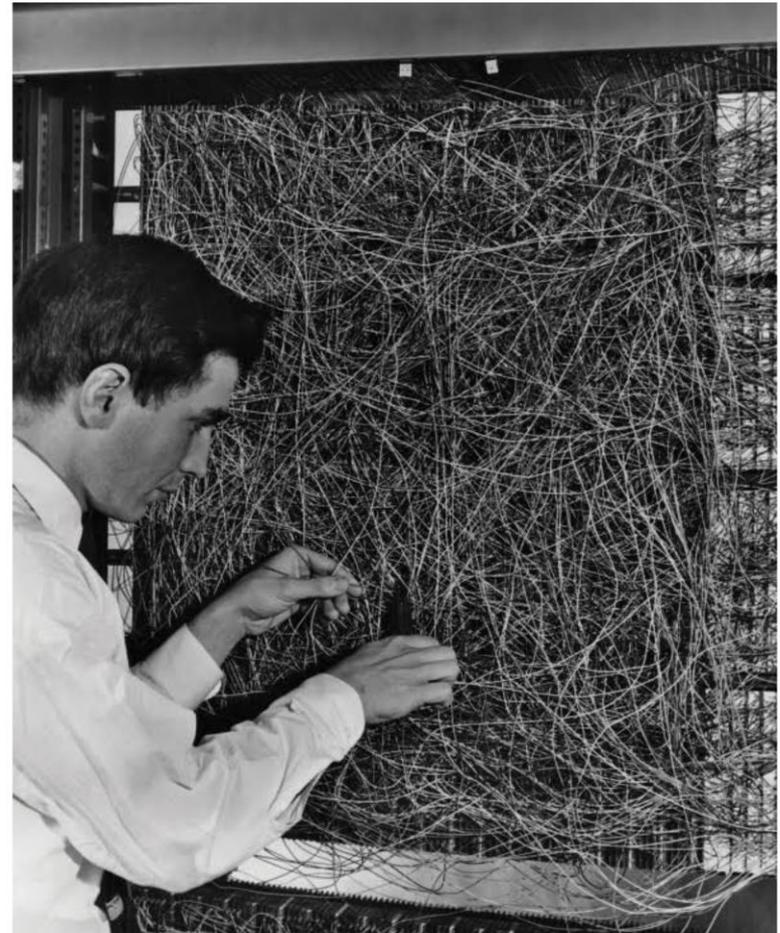
What is Machine Learning ?

- (ML) programs identify relationships between datasets with the goal of using the learned relationships to make predictions on new, unseen data – without explicitly being programmed how to derive the relationships.

Internet didn't kill books, Big Data won't kill PMs but will impact more and more their tools and profiles !!

AI is the way from linear regression and neural network to machine learning

- **Machine learning**
 - Relies on past data to make inferences about the future
 - Uses a training data set to fit the parameters to the model
 - Requires large amounts of data
 - Sees the world in probabilities
 - Updates views every time new data is added
- **Machine learning algorithms optimize an objective function**
- **Machine learning algorithms are generally classified as « supervised » (handwriting recognition) or « unsupervised » (cluster analysis)**



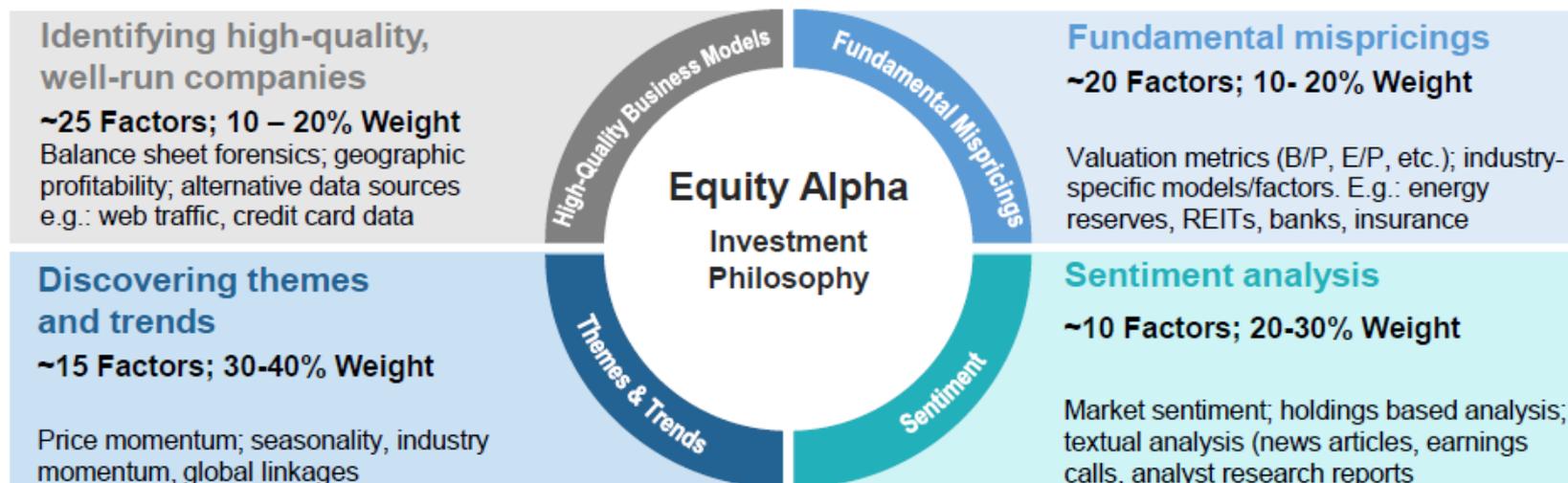
This early artificial neural network, at the Cornell Aeronautical Laboratory in Buffalo, New York, circa 1960, processed inputs from light sensors.

The power of data and machine learning in asset management

J Rodriguez-Alarcon

Equity Alpha Investment Pillars

Discovering Investment opportunities through data-driven analysis



A disciplined data-driven approach can uncover investment opportunities

Number of factors and weights are shown as of June 30, 2017. There is no guarantee that these objectives will be met.

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