## **CLUSTERING SECURITIES BASED ON PRICE MOVEMENT**

## Problem

A wealth management team wanted an effective way of identifying and explaining portfolio recommendations.

Specifically: when a given currency goes up, what else rises with it? Are there groups of securities that move together?

## Approach

Gramener sourced public and private data from the bank to create a correlation matrix of intra-day data across all securities, presenting it as a visual interactive dashboard.

The matrix was also **clustered hierarchically** to group similar securities, with similar blocks.

## Outcome

Clients began trading more actively based on the increased visibility of the correlations.

A client with a JPY and SGD portfolio consolidated into JPY, with a GBP hedge - the largest trade for our client that year.

A Gramener Banking Analytics Case Study

AUD 68 68% correlation between AUD & EUR			17	23	68	19	27	38	46	38	63	62	42	62	Australian Dollar	
EUR 64		11 8	2 EUR	-2	-1	51	14	32	30	38	68	36	32	43	32	Euro
Plot of 6 mont	th daily	18	-21	-23	-18	33	18	36	19	24	65	22	18	30	9	British Pound
AUD - EUR v		24	4	-20	-10	40	12	39	20	27	48	45	30	20	9	Silver
	MYR	-26	-25	-32	-26	78	56	63	58	63	25	42	37	-3	5	Malaysian Ringitt
		PKR	55	51	49	-55	-68	-61	-64	-67	50	36	28	54	40	Pakistani Rupee
		, i k	BSES	89	84	-48	-79	-76	-64	-67	35	59	53	58	68	Sensex
	1997 - 1894) 1897 - 1894) 1897 - 1894			`FTSI	98	-51	•77	·81	-71	-68	43	58	48	67	75	FTSE
	No. N.		P	1	GSP	-46	·72	-76	-68	-64	41	61	48	66	78	S&P
	e E o Star				a a a a a a a a a a a a a a a a a a a	SGD	79	85	89	94	-9	15	18	-22	-6	Singapore Dollar
hierarchically							JPY	86	87	85	37	-29	·27	-63	-49	Japanese Yen
		1.		۲. پې			and the second	XAU	86	94	24	-24	-22	-43	-50	Gold
		1. 1				فسيحد	A	f.	CHF	92	35	-17	-1	-50	-29	Swiss Franc
	10 M	÷.,		1		J.	and the second second	Ŧ	J.	CNY	26	-14	-8	-35	-31	Chinese Yuan
	A. A.S	(i)		eg di	19	Plo		f.co	rrol	atad	ΈK	46	32	70	50	Swedish Krona
					Block of correlated currencies						CAD	83	51	74	Canadian Dollar	
												200 200 200 200 200 200 200 200 200 200	INR	44	73	Indian Rupee
								Ē.						HKD	69	Hong Kong Dollar
	Mar Mar				1. A	12	ardige. Africa	10	13	12	R.	and the second			MXN	Mexican Peso