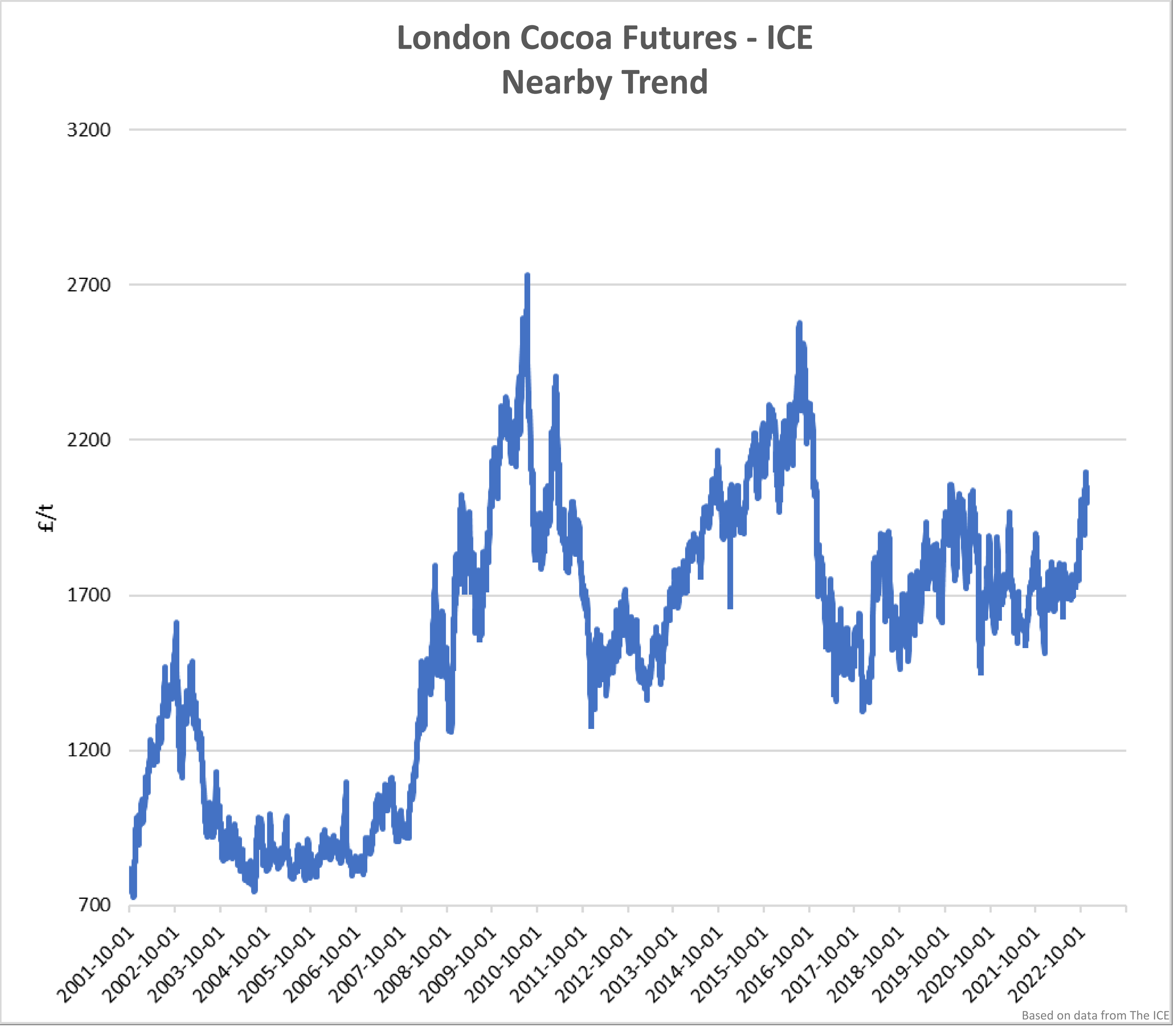
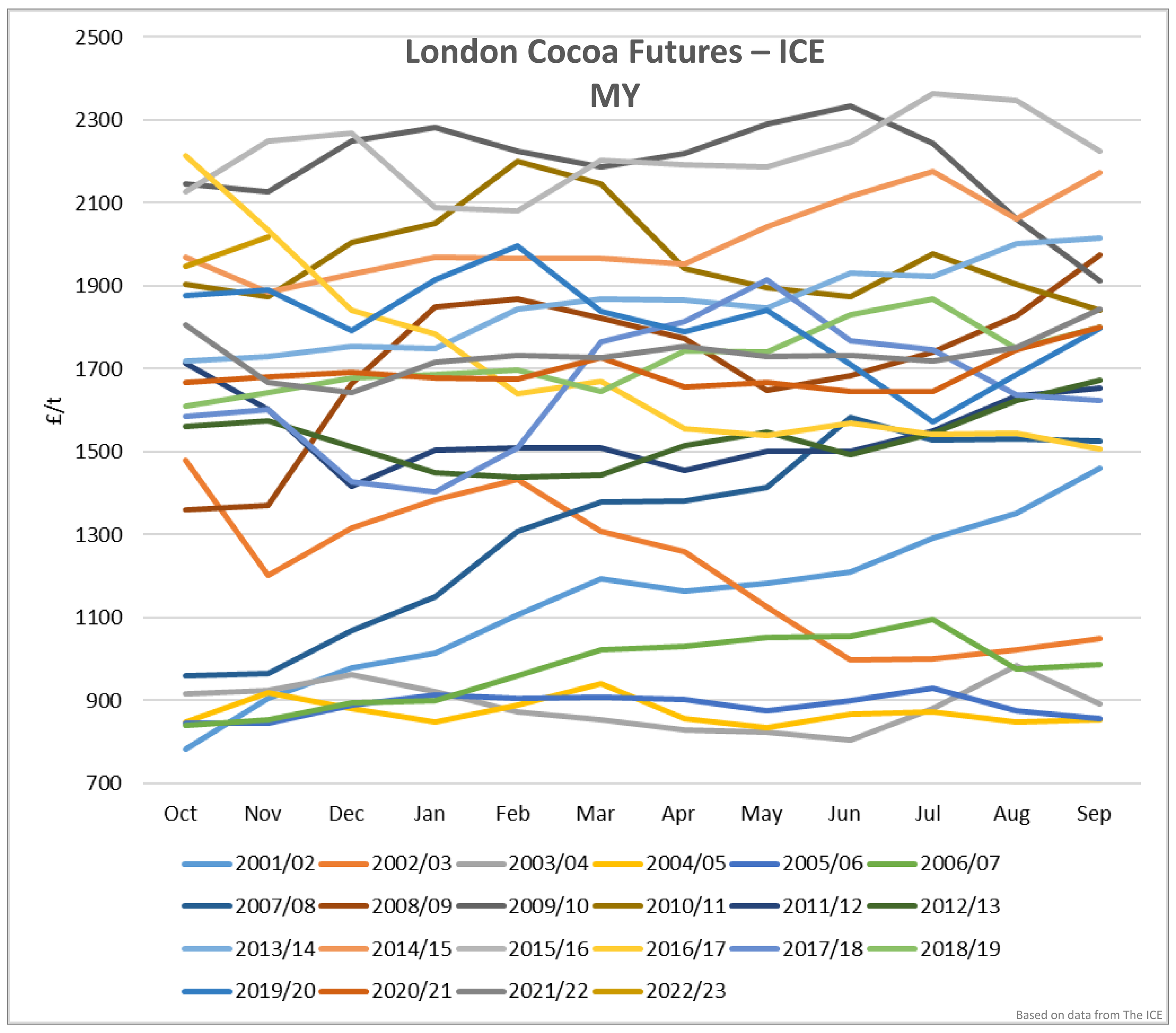
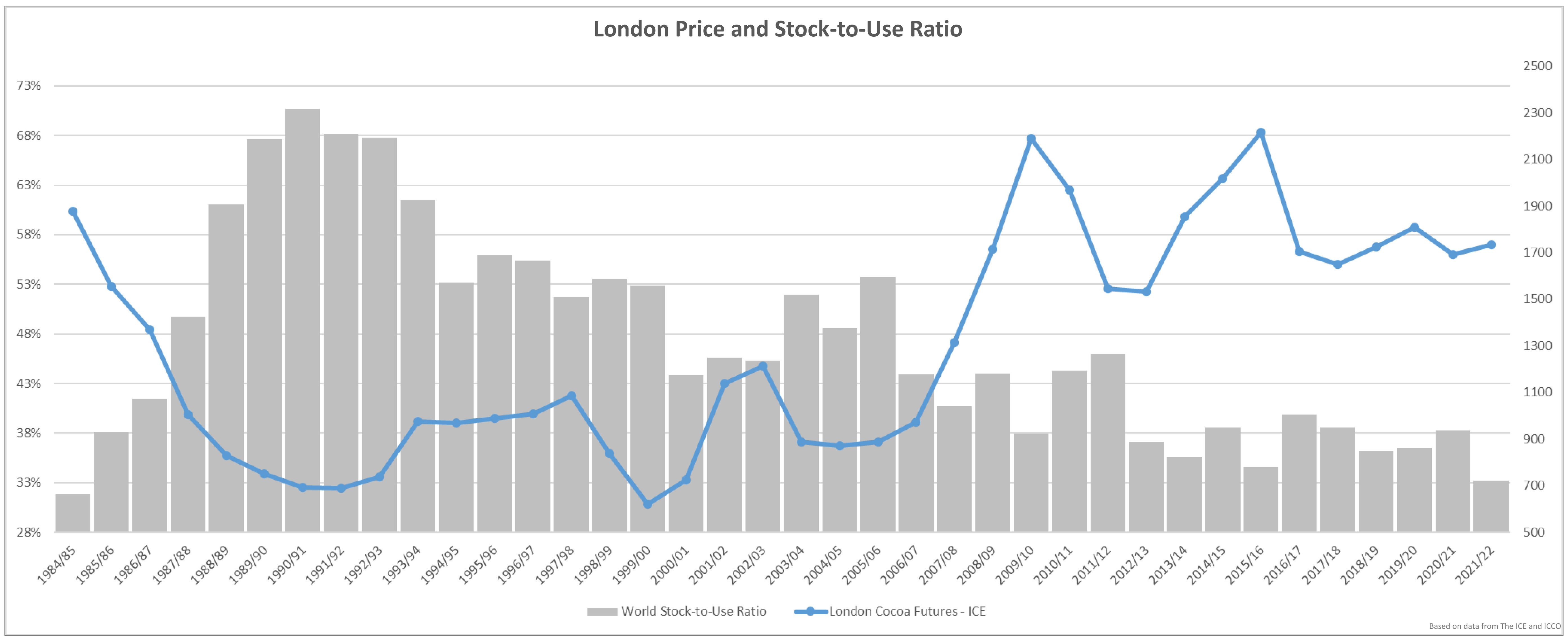
Cocoa price forecasting as a tool to increase derivative contracts potential in managing farmers' price volatility risk

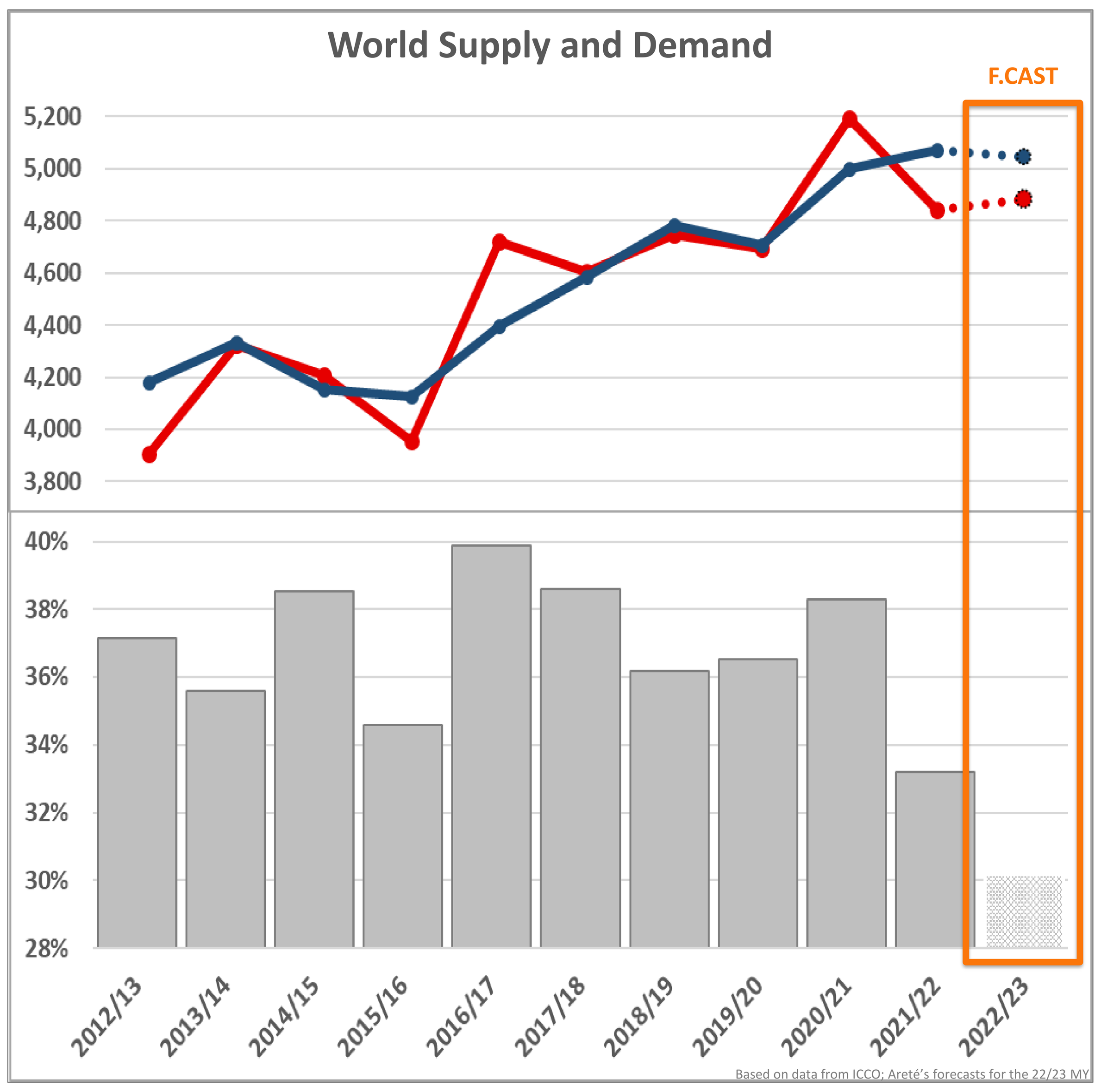


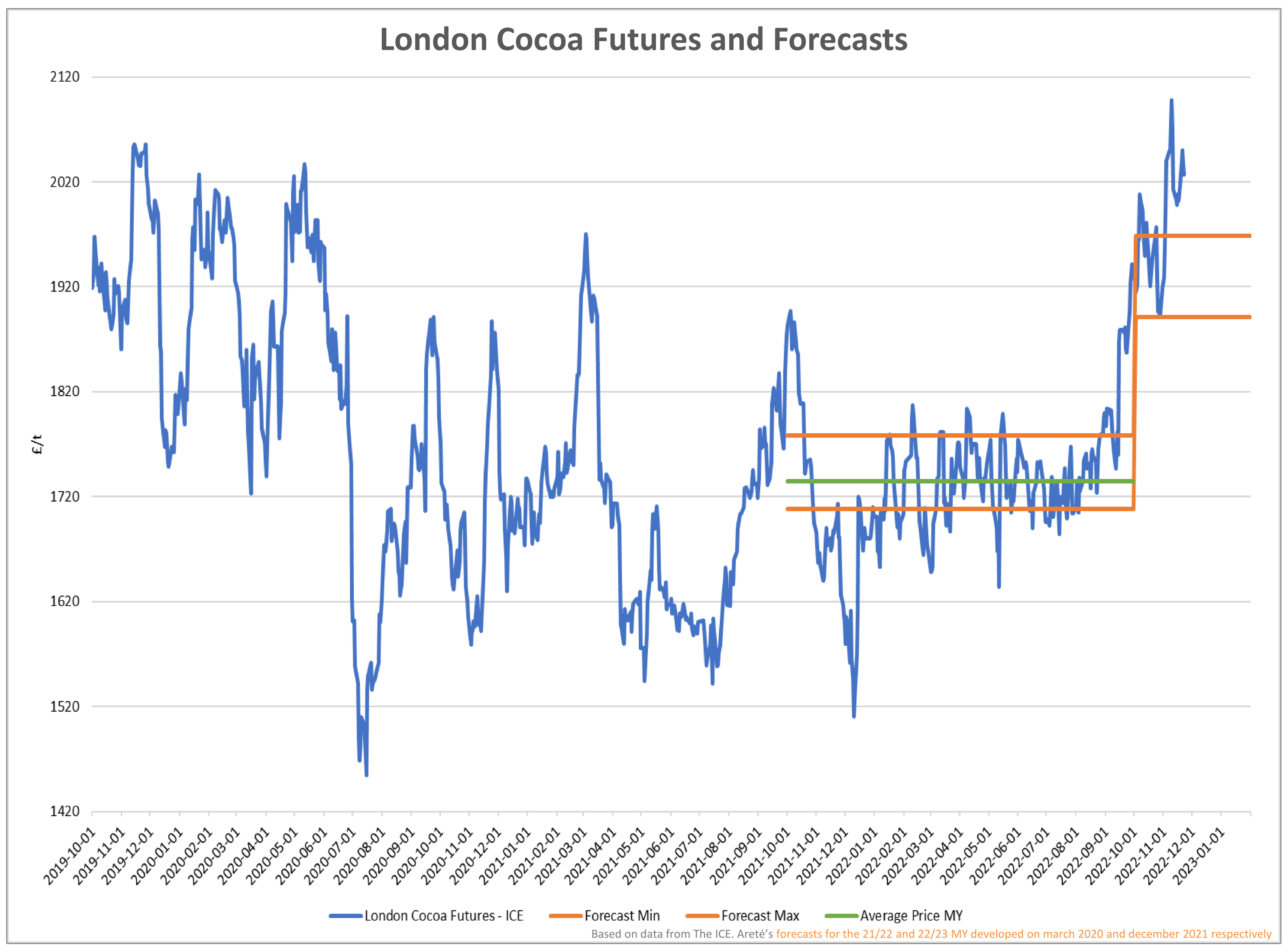


- The **cocoa market** has always been affected by a **significant price volatility**.
- In the last decade, London cocoa prices ranged in between a maximum of around 2.600 £/t and a minimum of around 1.300 £/t, with **huge fluctuations either within a marketing year or across marketing years**.
- **Price volatility is one of the main sources of farmers' financial risks** and leads to a **certain level of uncertainty about their income**.
- **Unanticipated changes in supply and demand** often result in **large price fluctuations**. This is mainly due to the **inelasticity of market fundamentals**.



- There is a **statistically significant relation between cocoa fundamentals and cocoa prices**. The higher the **Ending Stock-to-Use Ratio** is, the higher the cocoa abundancy is and the lower the cocoa price is and vice-versa.
- We exploit the relation to **develop econometric models aimed at forecasting the London Cocoa price.**
- Depending on the MY models can **take into account the effects on prices of others exogenous variables as well** (e.g. macroeconomics variables, pandemic, shocks on input costs…).





- In particular, **for the last two MY** we used an **AR model that forecasts the log differences of London Cocoa futures**.

Model 17: ARMAX, using observations 1985-2020 (T = 36)					
Dependent variable: d_l_THEICE_LONDON					
Standard errors based on Hessian					
	coefficien	std. error	z	p-value	
phi_1	0.440471	0.157473	2.797129	0.005156	***
phi_2	-0.48366	0.139516	-3.46667	0.000527	***
d_l_RATIO_WR	-0.63377	0.179105	-3.53856	0.000402	***

London Cocoa Price 22/23 Forecast Sensitivity			Net Production (1,000 t)						
			-5%	-2.5%	-1%	base	+1%	+2.5%	+5%
			4640	4762	4835	4884	4933	5006	5128
Consumption (1,000 t)	-5%	4794	1872	1780	1725	1688	1651	1596	1504
	-2.5%	4920	1994	1904	1851	1815	1779	1725	1636
	-1%	4996	2064	1976	1923	1888	1852	1799	1711
	base	5046	2110	2022	1970	1935	1900	1848	1760
	+1%	5096	2155	2068	2016	1982	1947	1895	1809
	+2.5%	5172	2220	2135	2084	2050	2016	1964	1879
	+5%	5298	2325	2242	2192	2159	2126	2076	1992

Conclusions:

Price forecasting could represent an instrument for market players to better take advantage of the use of derivatives (e.g. futures and options) in financial risk management. **Price forecasts can provide a reference point that can be used by players to optimize strategies in terms of timing and volume.**

- **Creating added value directly or indirectly for farmers and, ultimately, improving farmers' income.**

Policy Implications for improving farmers' income:

- **Improving cocoa market players access to market intelligence tools, finance and risk management instruments**.
- **Farmers can take advantages** by the use of the aforementioned tools **both indirectly and directly**.
  - **Promoting the development of mechanisms to shift at least part of the added value from operators like parastatal institutions, industry and traders to farmers.**
  - Promoting the **formation of farmers organization** to increase their **direct access to financial markets and their bargaining positions.**
- **Increasing the amount, transparency and accessibility of market information**. The quality and the timing of fundamentals data and the price forecasting accuracy are positively correlated. **We support the importance of the ICCO supply and demand data and forecasts**.

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