The Challenges Facing Palm Oil in the 21st Century

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The four main challenges facing oil palm

- The poor growth rate in yields in relation to other sources of vegetable oils;
- The difficulties raising labour productivity in the sector, largely the result of the difficulties in mechanising harvesting operations;
- Functional obstacles to palm oil's use in cooler climates; and
- Non-tariff barriers, in the form of sustainability and life cycle analysis criteria that restrict the use of palm oil in high income markets
- I shall focus on the first two today, since the last two will be covered fully in later presentations.

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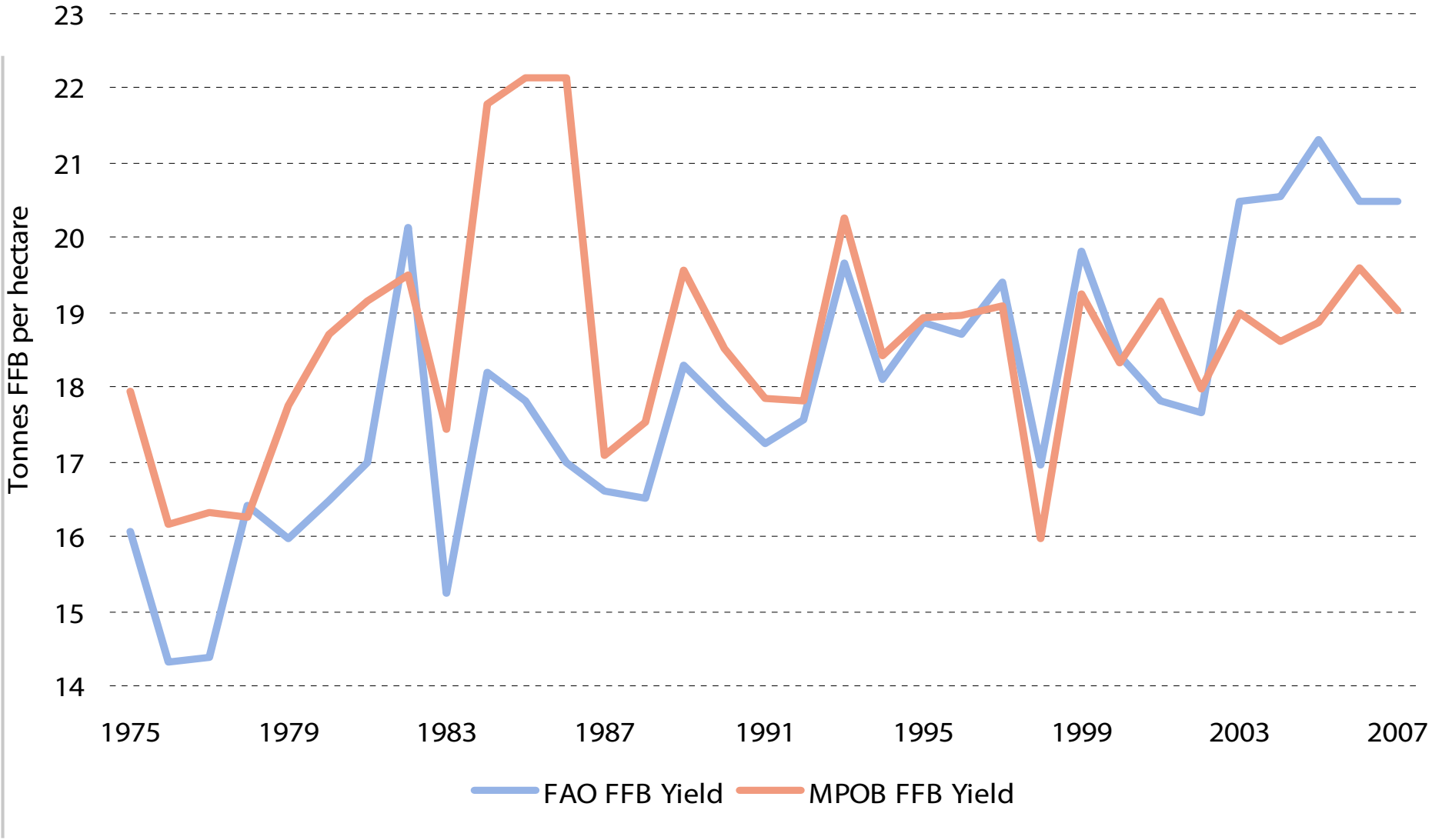
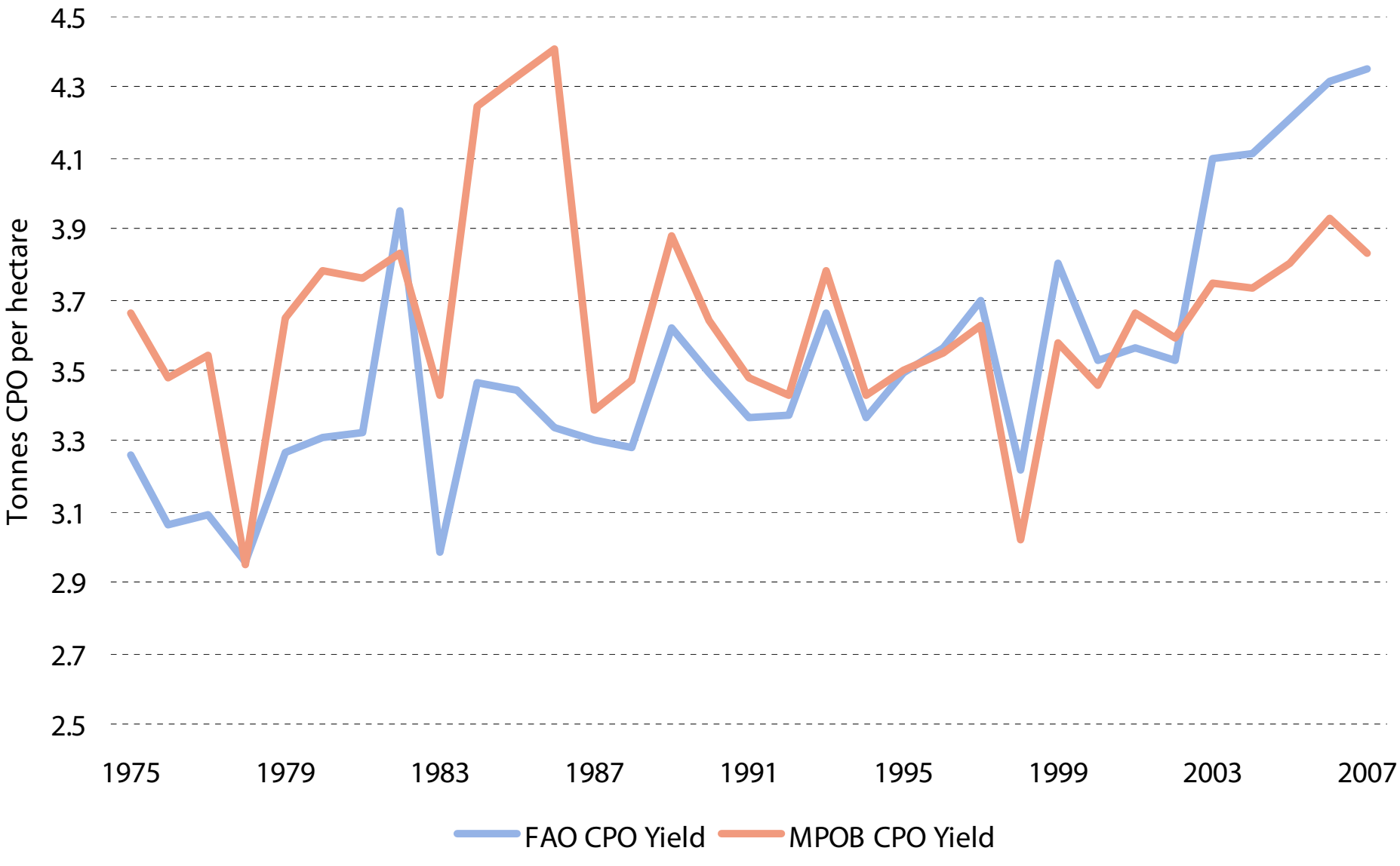
Identifying the True Trend in Oil Palm Yields

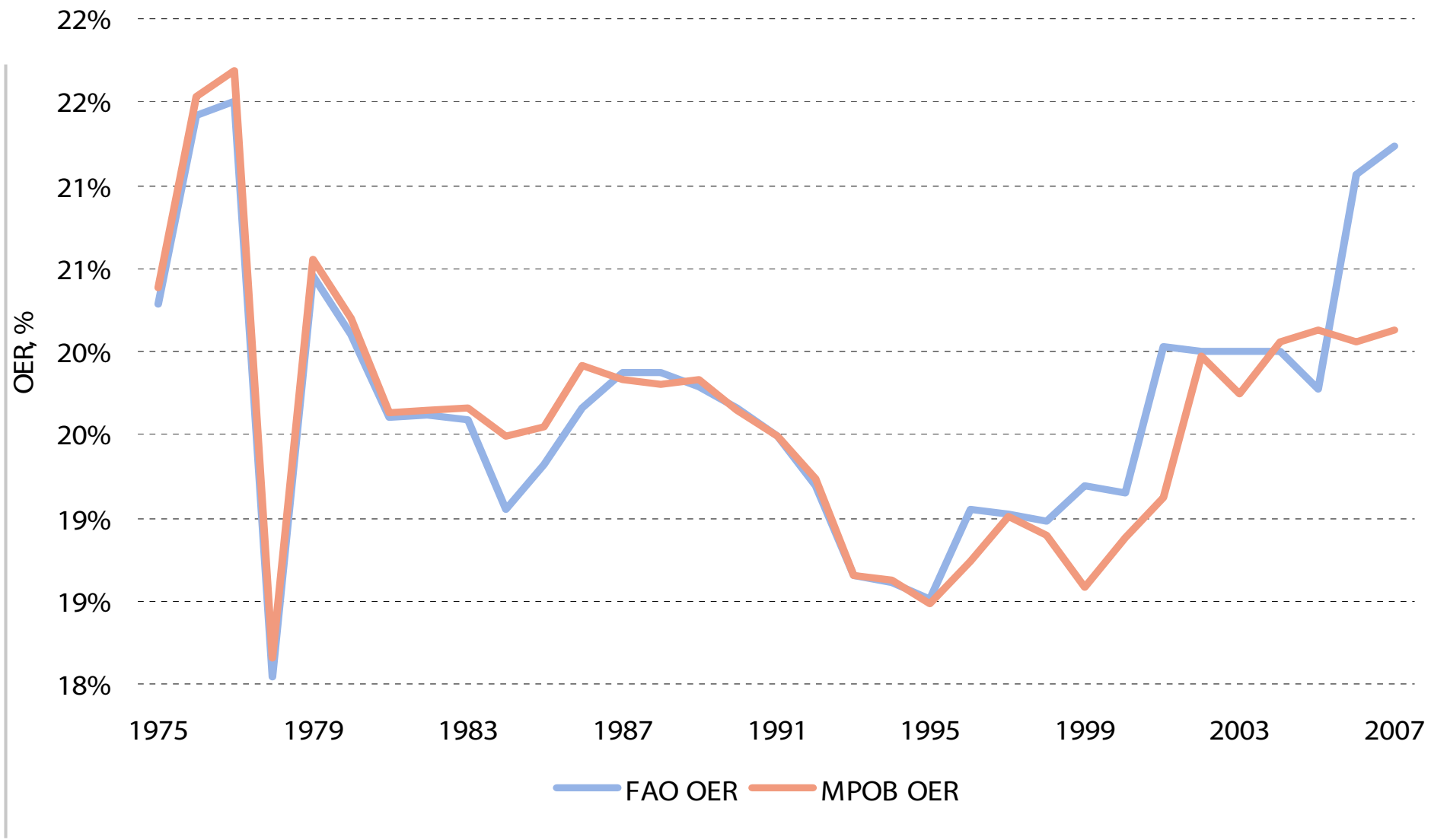
Sadly, we begin with a problem regarding raw data. Compare FAO and MPOB time series for Malaysian FFB yields/hectare



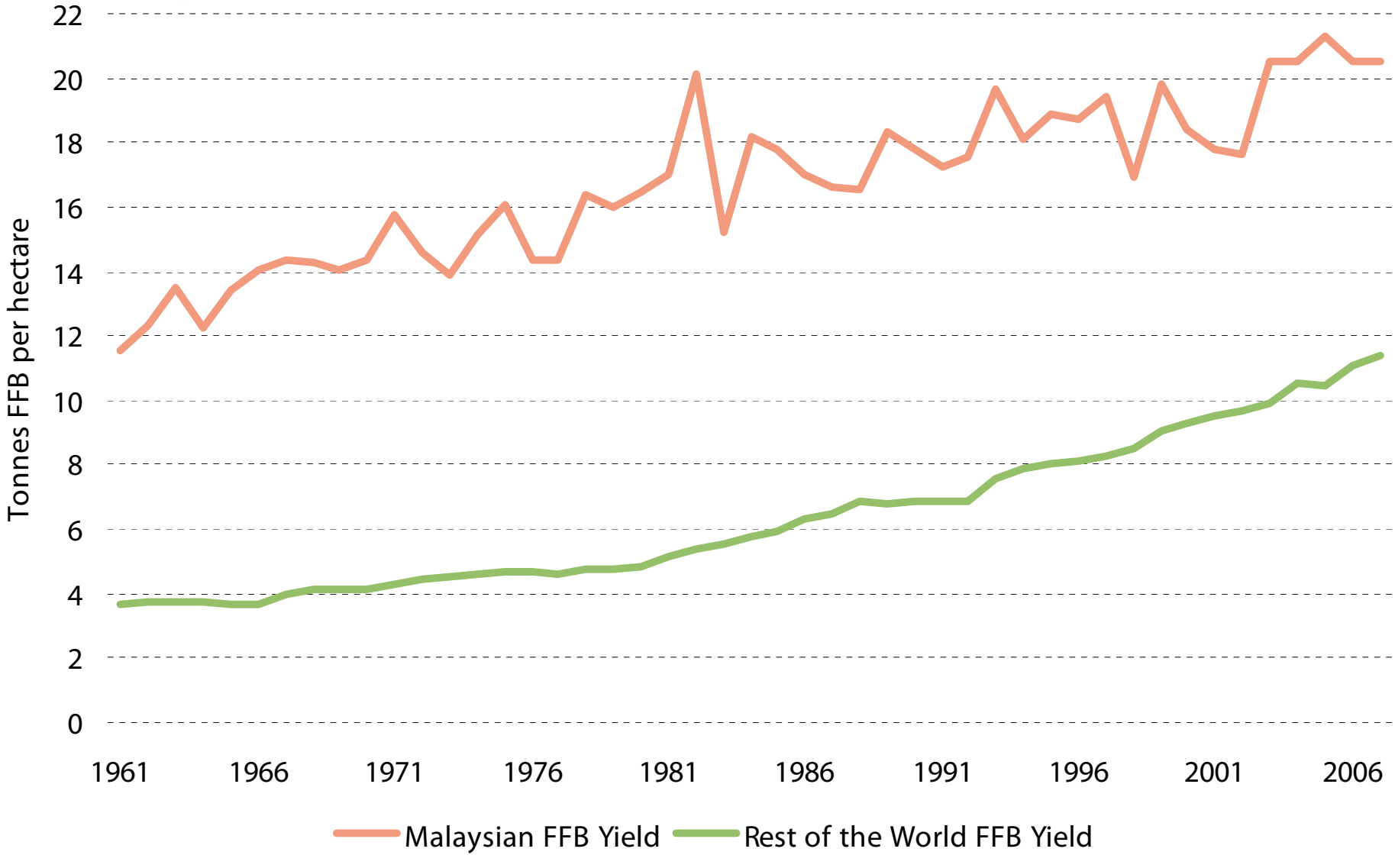
This gives rise to the following time series for Malaysian CPO yields/hectare



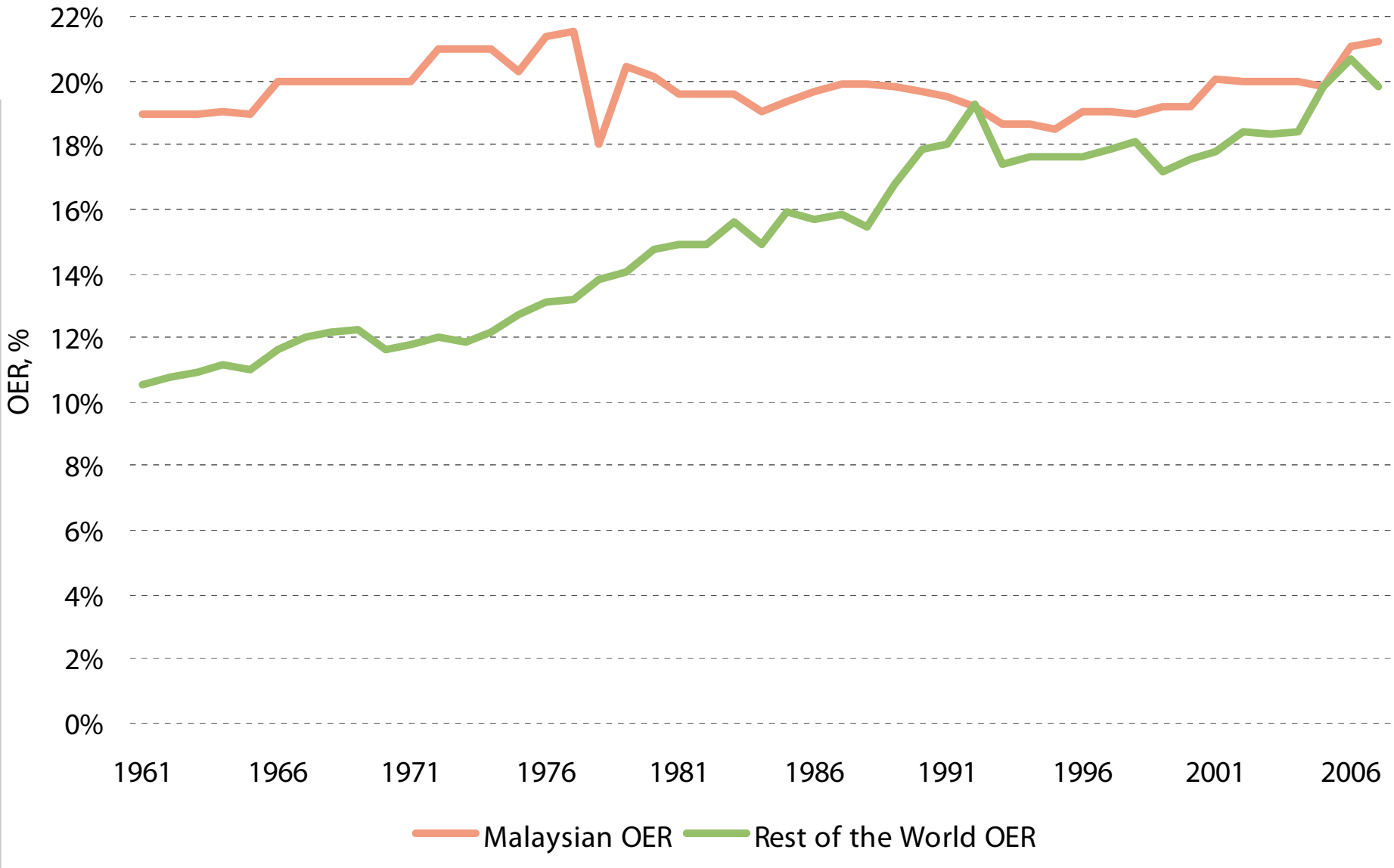
The FAO and MPOB time series for OER in Malaysia are much closer, as you can see



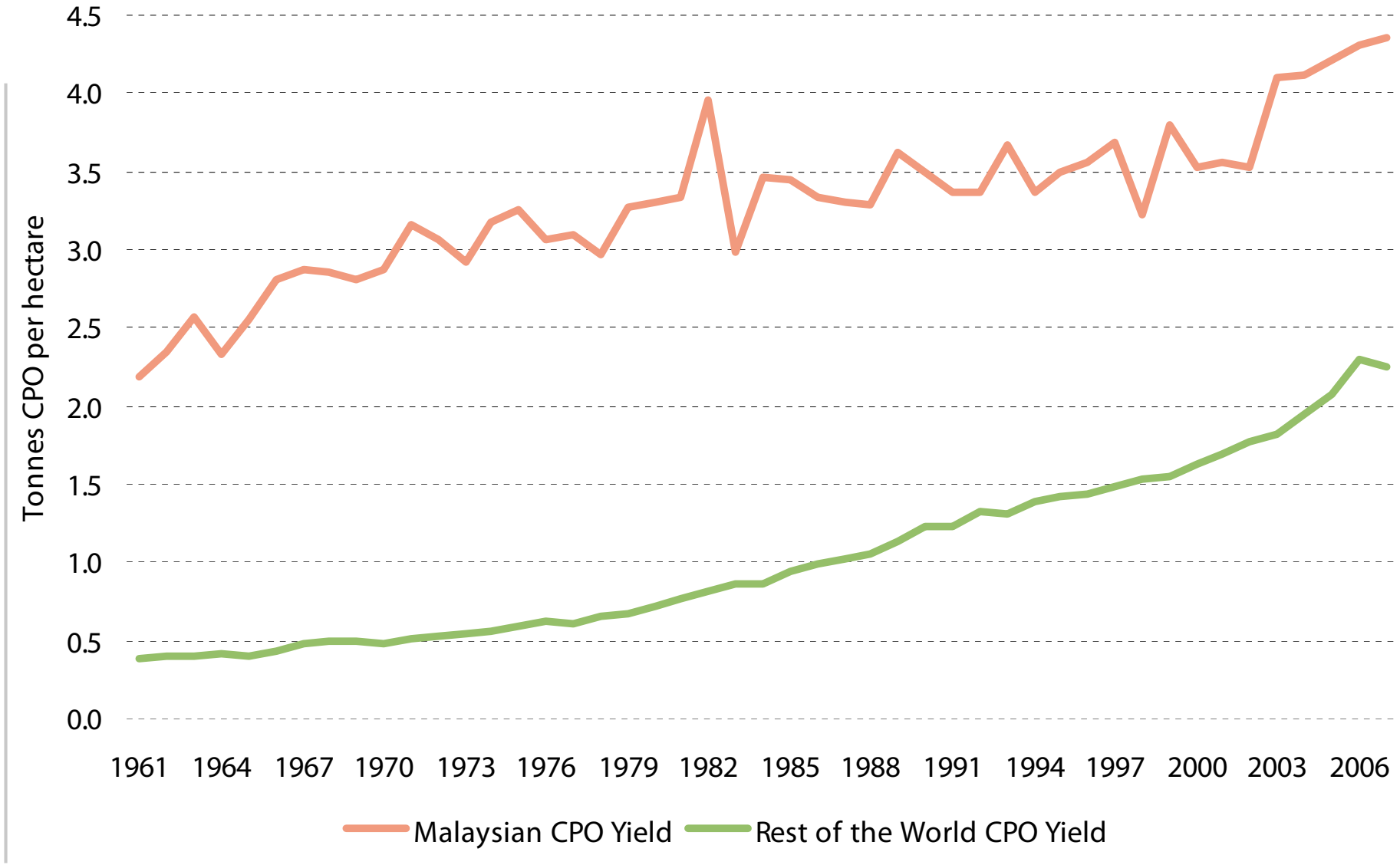
FAO time series for FFB yields for Malaysia and for Rest of the World imply steadily rising trends



… and similar improvements for OER in Rest of the World



.. which generate the following FAO estimates of the CPO yield trends for Malaysia and for Rest of the World



What data to use?

- The marked contrast between MPOB and FAO data on Malaysian FFB yields inevitably raises doubts about the validity of FAO data for other countries.
- I am certain that the trend in yields in the Rest of the World (all countries other than Malaysia) is upwards, because there has been a steady shift in the centre of gravity in Rest of the World output away from West Africa towards Indonesia, but sadly Indonesia does not yet have consistent long run series of data that are comparable to that prepared by MPOB.
- Therefore, I will use solely the MPOB data in the comparative analysis that I will present today.

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The Poor Yield Growth in Oil Palm

Using (more reliable) FAO data for annual crops, you see better yield growth for world soybeans and rapeseed than for Malaysian FFB

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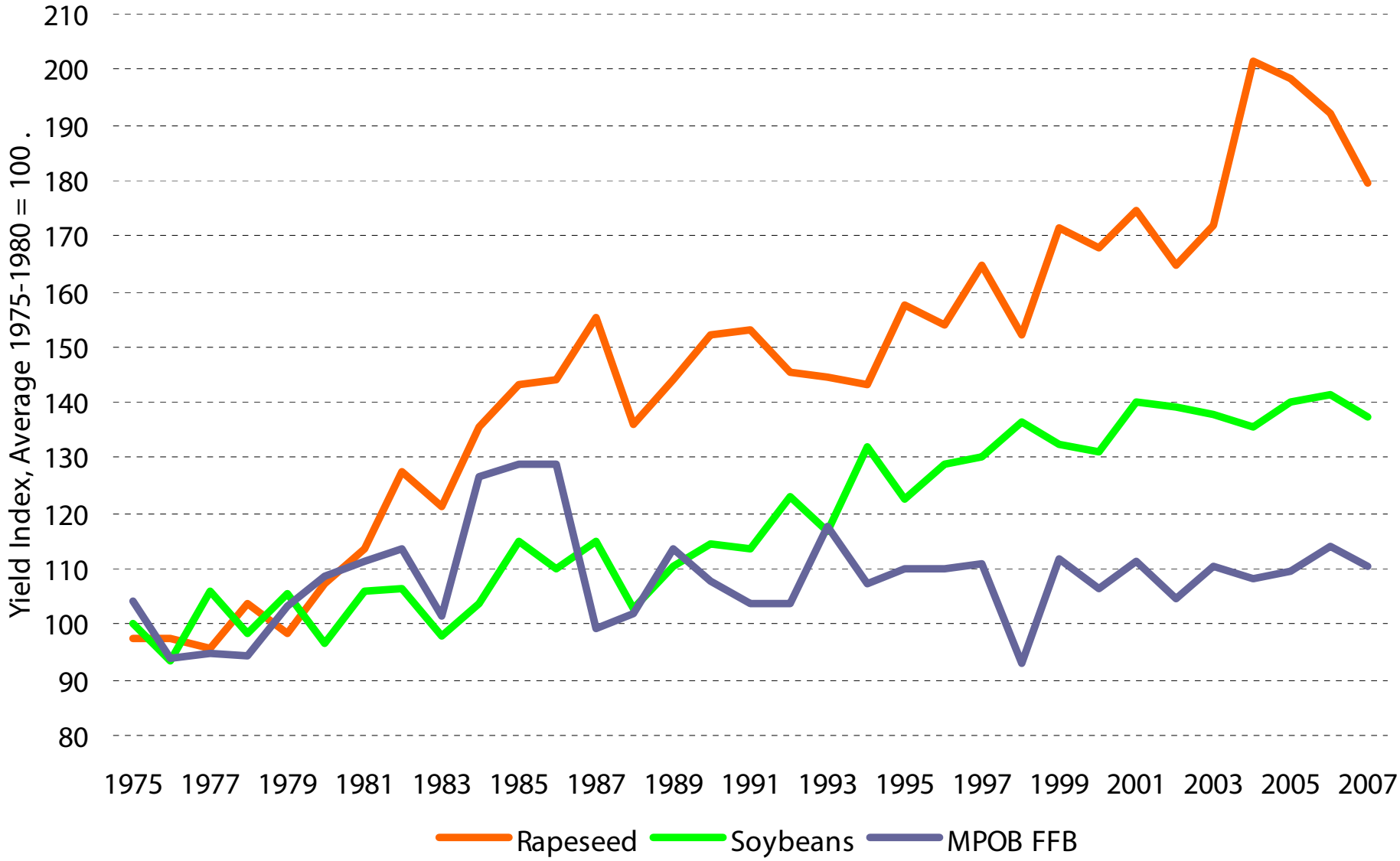
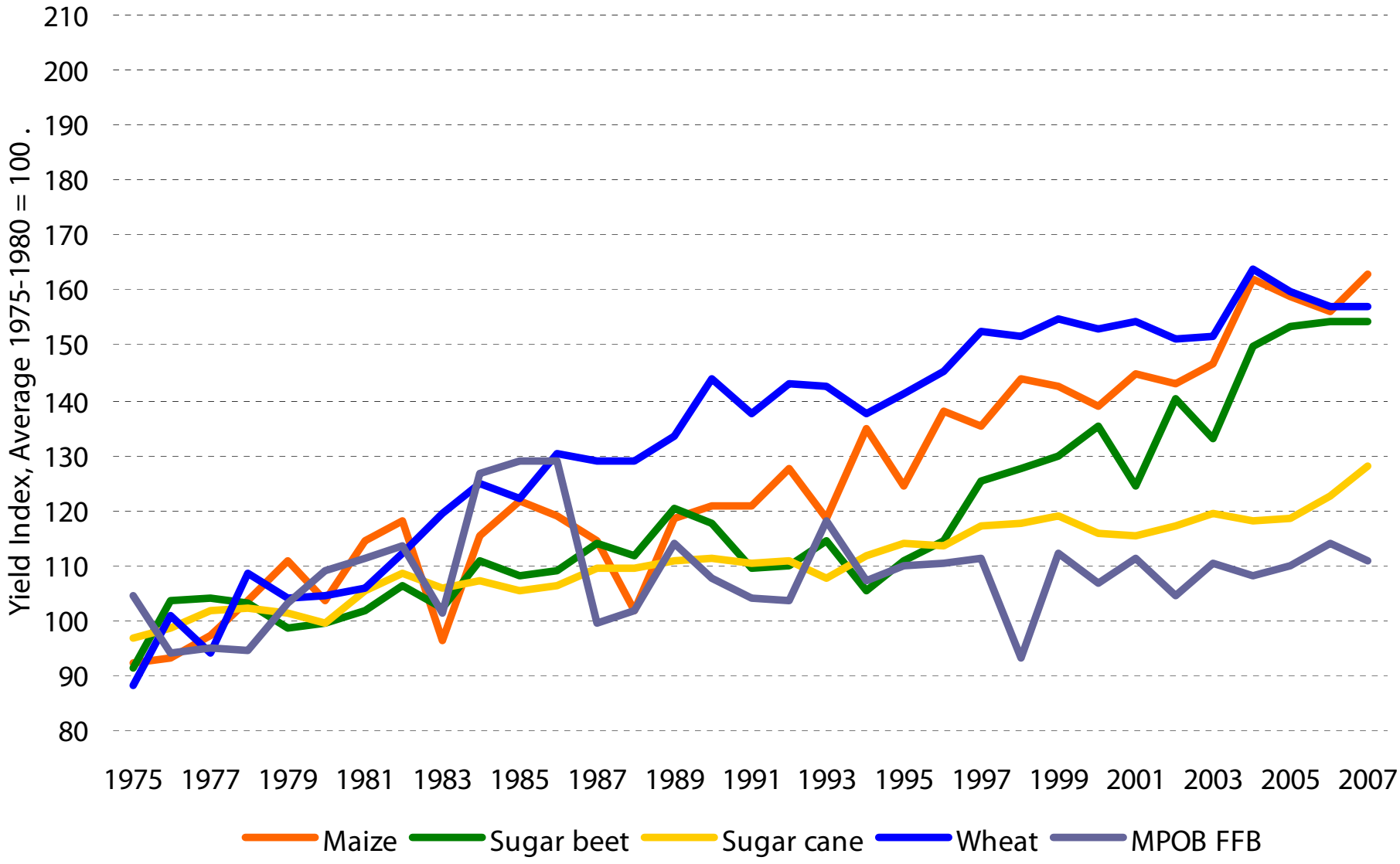


Comparing average world yields of wheat, sugar crops and maize with Malaysian FFB, oil palm again records the slowest growth overall



Contrasting yield growth for a range of crops since 1975, you see that those faring worst attract the lowest investment in new seeds.

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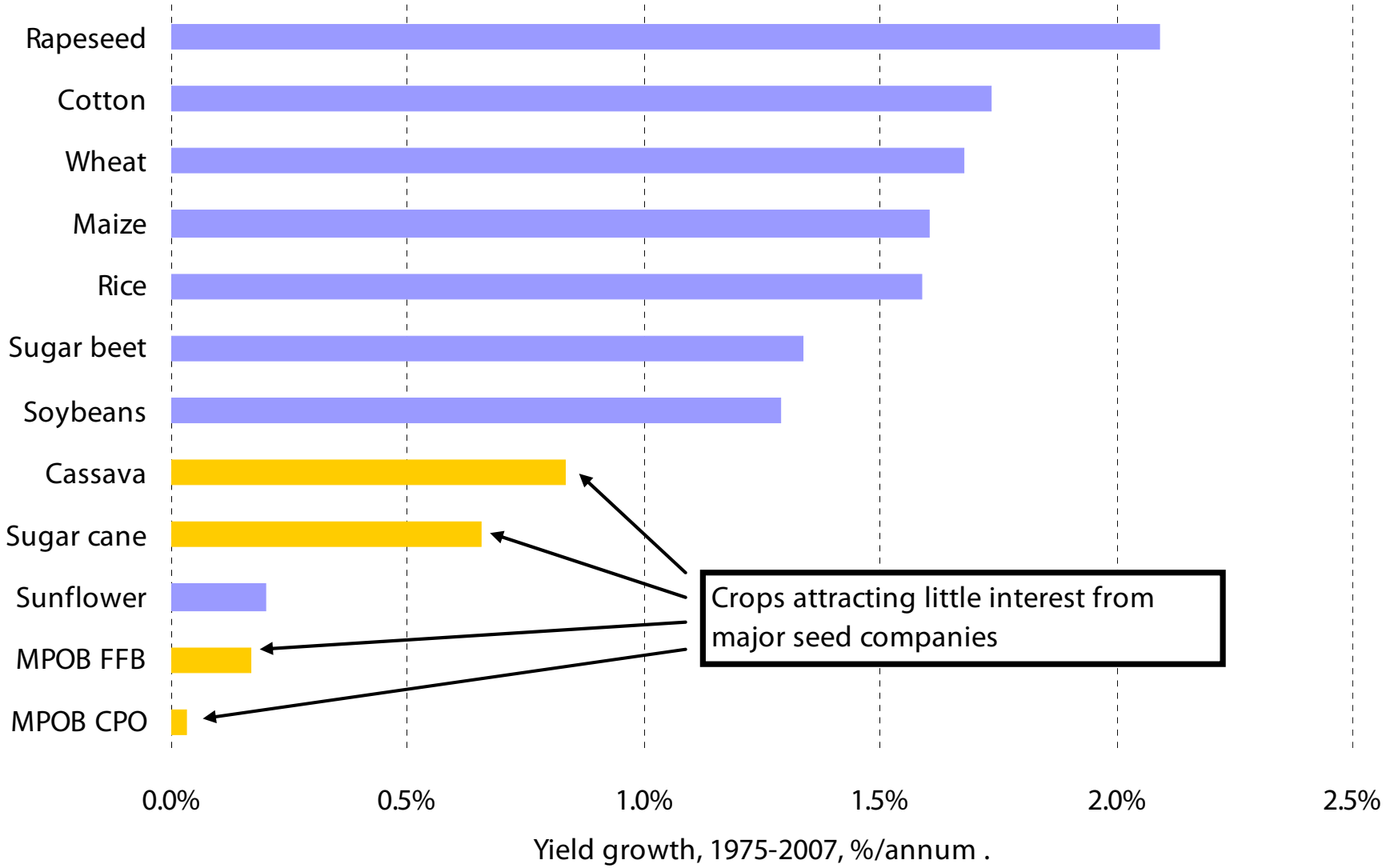

Global yield trends reflect several factors: improved varieties, but also a shift in areas towards the higher yielding regions

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- Our own analysis suggests that around half the rise in average global agricultural yields (and reduction in average production costs) is a result of production gravitating towards more productive locations.
- For oil palm, Indonesia's expansion was the driving force behind higher Rest of the World yields.
- Malaysia, too, should have benefited via the growing importance of high yielding areas in Sabah.
- One topic that deserves attention for a tree crop like oil palm is how one should best adapt comparisons to allow for the yield profile over the life of the tree.

The M$64 billion question: why does oil palm in Malaysia, the world leader in research into the crop, do so poorly in boosting yields?

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- Is it because it is a tree crop?
- No. Well managed oil palm plantations, as well as other tree crops, such as rubber, are consistently able to notch up yield increases of 10%-plus per decade when planting material is compared in its overall yield performance in the 1980s vs. the 1990s vs. 2000s.
- In the case of natural rubber, the underlying average rate of yield increase since 1975 was 1.8% per annum, largely the result of improved clonal varieties and more frequent rounds of tapping, notably in Indonesia.
- (Undoubtedly fewer harvesting rounds, in response to higher wages, have harmed Malaysian oil palm yields.)

I believe a fundamental problem besetting the oil palm sector is the poor financial returns from developing improved seeds

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- Many estate managers make false economies and buy cheap seeds, ignoring the subsequent loss of income.
- This deters investment in oil palm seed breeding by the world's leading seed companies, who have shown a willingness to invest vast sums in seed development for products such as maize, soybeans and rapeseed.
- It is significant that most other crops that have a poor trend in yield are vegetatively propagated, which means that new planting materials cannot command a value that makes them commercially interesting to seed companies.

With a few back of the envelope calculations, one can see the importance of harnessing the talents of seed companies

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- The world oil palm industry has an annual turnover of maybe M$70 billion, excluding downstream activities.
- Other crops suggest that yield increases of 1.0-1.5% per annum are well within reach.
- In simple terms, this would add revenues of maybe M$1 billion each year to the sector as a whole.
- Surely, with the right incentive structure, it should be possible to give seed companies some of the extra "cake", to induce them to make it steadily bigger, while simultaneously making plantations more profitable.

The challenge is to reward developers of improved varieties, without discouraging planters from using them

- The problem facing the oil palm industry is similar to that confronting its sugar cane counterpart, but they both they share one great advantage, which is that all the crop must be processed at a mill.
- The challenge is to devise means (e.g., genetic markers) of identifying different varieties when they enter a mill, and then to pay a standard royalty per tonne to the seed company, instead of an upfront payment. This is now being studied actively in the sugar cane industry.
- A royalty as low as US$1/tonne of FFB and a 5% share of the world market would yield income with a present value of over $100 million at a 10% discount rate.

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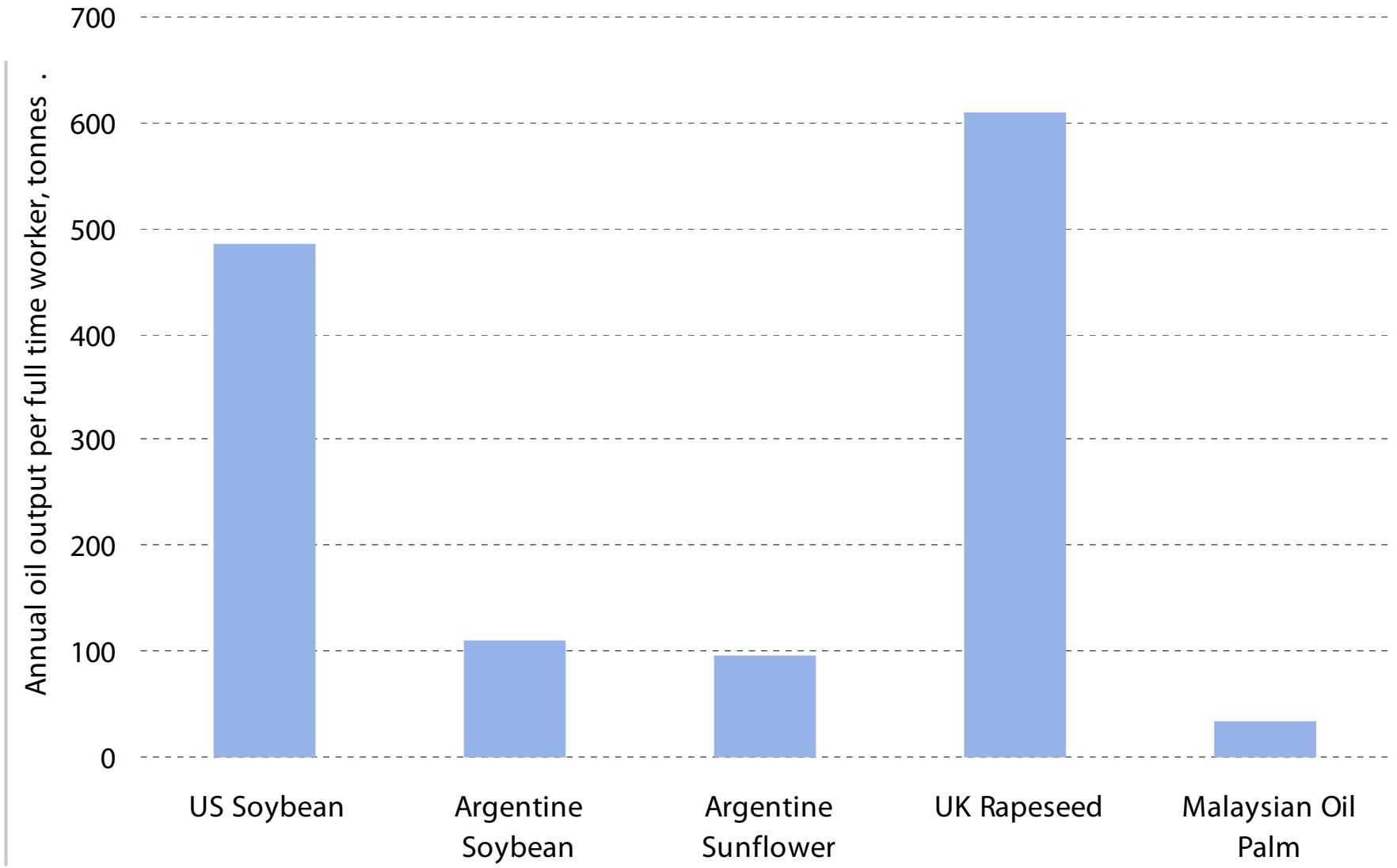
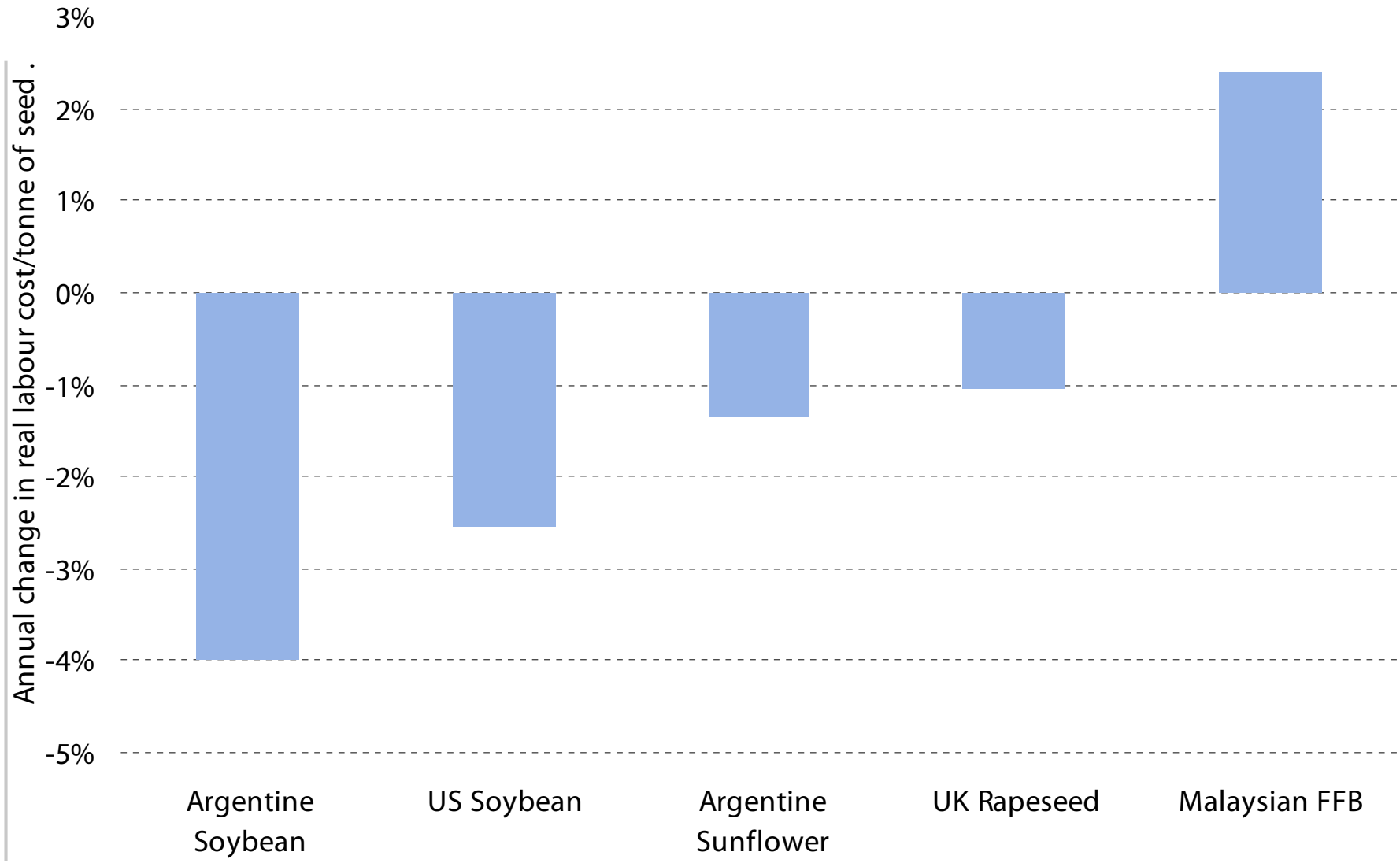
Oil Palm Labour Productivity and Mechanisation

Despite high oil yields per hectare, oil output per full time worker on oil palm estates in the mid-2000s was very low.



Malaysia has suffered a steady increase in real labour costs per tonne of oilseed since the mid-1980s, unlike the annual oilseeds



What can be done to boost oil palm's labour productivity?

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- Oil palm is steadily losing ground against other oil-bearing crops in terms of labour productivity. Since the introduction of the pollinating weevil, the number of hectares per worker in the sector has barely changed.
- Meanwhile, labour productivity is rising among other oilseeds, helped by mechanisation, economies of scale and, in some cases, the use of biotechnology.
- Coffee and sugar cane have both successfully introduced mechanical harvesting. Oil palm is more of a challenge.
- To tap the best research, I suggest creating a large fund and inviting leading robotics institutes to bid, and then select two to develop rival oil palm mechanical harvesters.

The challenge in mechanising harvesting is different from that in seed development

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- Without doubt, harvesting represents a major obstacle to a better yield performance. However, in this case, the problem is not caused by the practical difficulties of rewarding private sector innovators, as it is with seeds.
- The challenge with mechanical harvesting is to create a sufficiently large critical mass of investment in relevant research to overcome the high threshold needed to get a viable research programme off the ground.
- Again, simple calculations reveal the attractions of such programmes. It should be possible to reduce total labour use per hectare drastically. Annual reductions of just 2.5% would add M$250 million to Malaysian plantation profits.

Functional Limitations to Palm Oil Use

As a tree crop, with several years before new fatty acid profiles can enter the market, oil palm cannot compete with annual oilseeds

- Annual oilseeds with modified fatty acid compositions can be developed and introduced to the market comparatively rapidly. Low linolenic/high oleic varieties of soybeans, rapeseed and sunflowers are now on the market, offering natural stability to potential users.
- It is very difficult for oil palm to compete with this pace of innovation. Furthermore, the development of such special types of oil requires a new identity preserved (IP) supply chain, with additional segregation costs along the flow from plantation to final user.
- I feel that fractionation offers a much speedier, and less complex, technology to achieve much the same result.

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Non-Tariff Barriers to Palm Oil Use

New obstacles are being placed in the way of palm oil in the EU and US markets

- EU and US governments are erecting a range of non-tariff barriers to oil palm, invoking sustainability criteria and life cycle analyses, for example, as their justification.
- At the same time, they are proposing default greenhouse gas emission values for palm oil and cut-off thresholds for eligibility for biofuel tax incentives that seem to have been chosen so as to bar palm oil from these incentives, while (just) allowing locally produced oils, such as rapeseed oil and soybean oil, to exceed the thresholds.
- Because these policies appear to be politically determined, rather than based on absolute scientific values, it will be very difficult to overcome or dismantle the new barriers.

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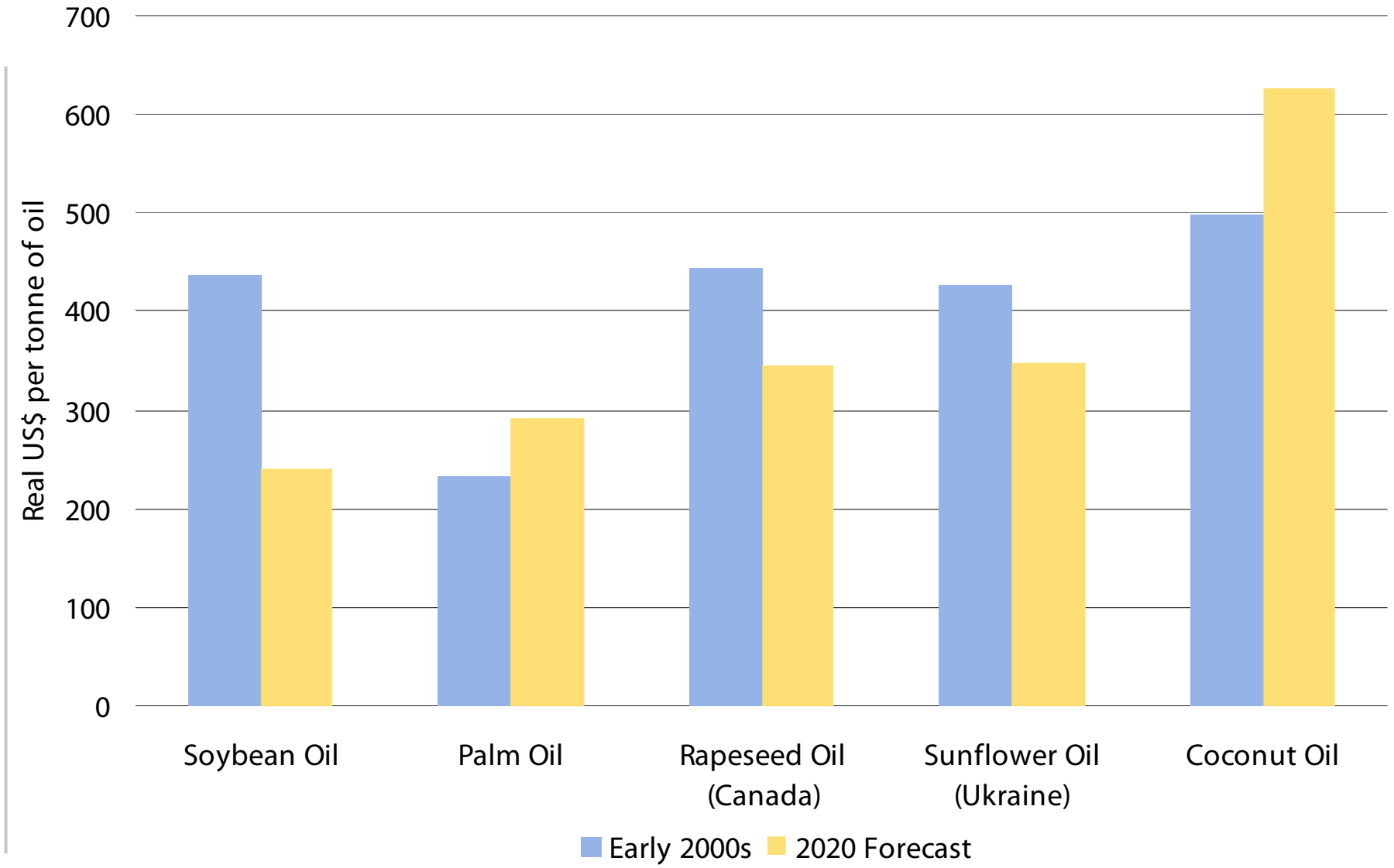
The Implications of a Continuation of Past Trends for Palm Oil

Extrapolating past labour productivity, wage and yield growth trends to 2020, palm oil loses much of its production cost advantage



Long run trends in real soybean meal and oil prices since 1950 have lifted the value of meal credits vs. the income from sales of oils

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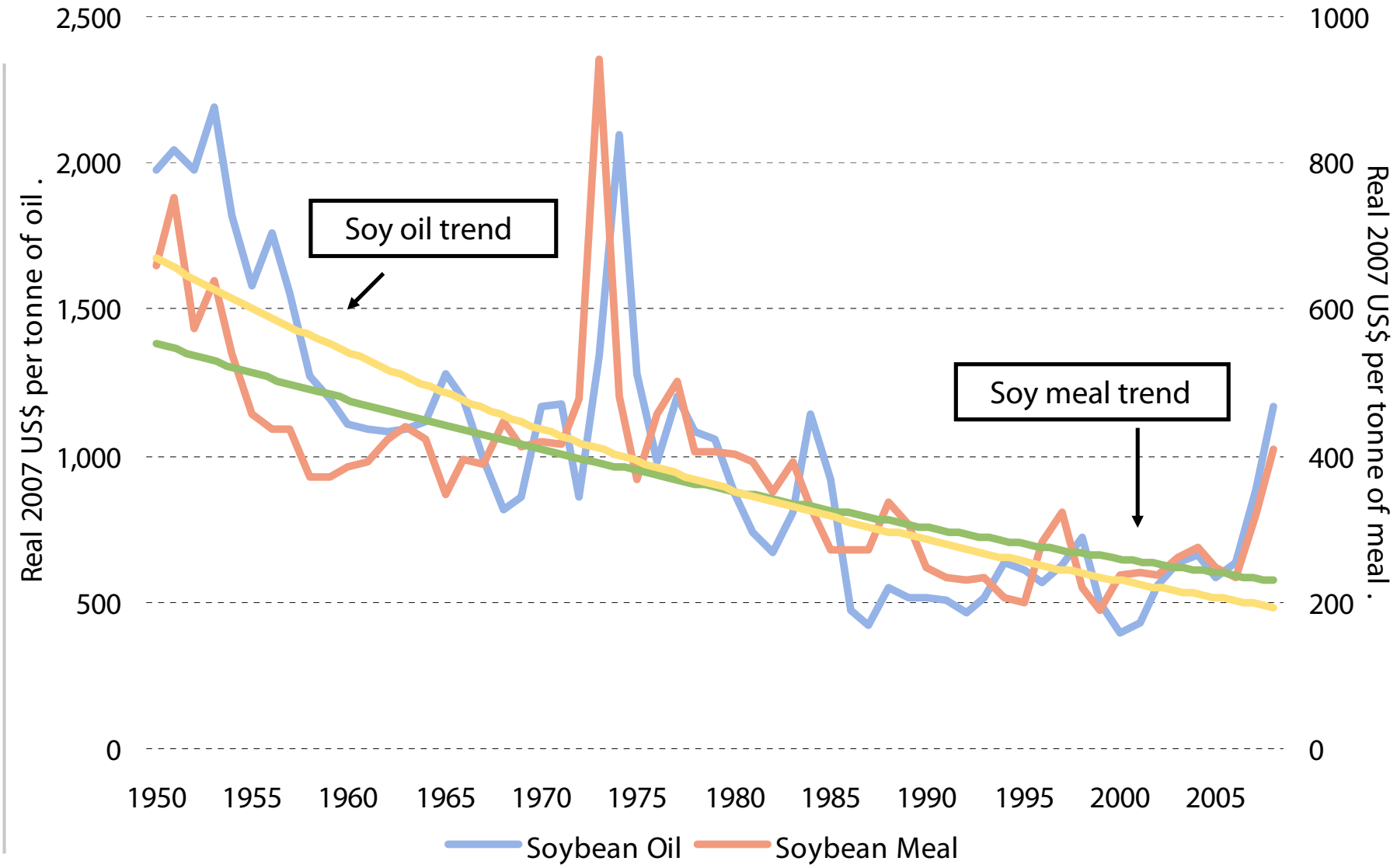

Without a revolution in labour productivity and/or an acceleration in its yield growth, palm oil's competitive advantage will vanish.

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- The continuation of past trends in labour productivity, real wages and crop yields – for oil palm, as well as annual oilseeds – will see other vegetable oils (helped by meal credits) overtaking palm oil in cost-competitiveness.
- By 2025, palm oil runs the risk of becoming one of the higher cost major vegetable oils, overtaken by soybean, rapeseed and sunflower oils in its production costs.
- One response will be a revival in interest in oil palm in Africa, attracted by the region's low wages.
- Other responses will, I hope, include a focus on the issues raised earlier, namely attracting large scale investment in improved varieties and in new forms of mechanisation.

Thank You

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