Crop vs. beef production: Competition for land in Argentina and Brazil

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agri benchmark **Beef & Sheep Conference**
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Why care about the competition beef vs. crop?

1. Globally, strong increase in ag commodity prices
2. Increase of feedlots in Brazil and Argentina
3. Strong growth in crop land
4. Factors relevant for a shift in land use:
    a) Return to land differences
    b) Investments needed (volume and capital cost)
    c) Market risks (price / access to exports)
    d) Production risks / trends in productivity growth

Definition of terms used

1. <u>Return to land</u> (USD/ha):
   Gross revenue from all crops / outputs (USD/ha)
   minus
   total cost [excl. land cost] (USD/ha)

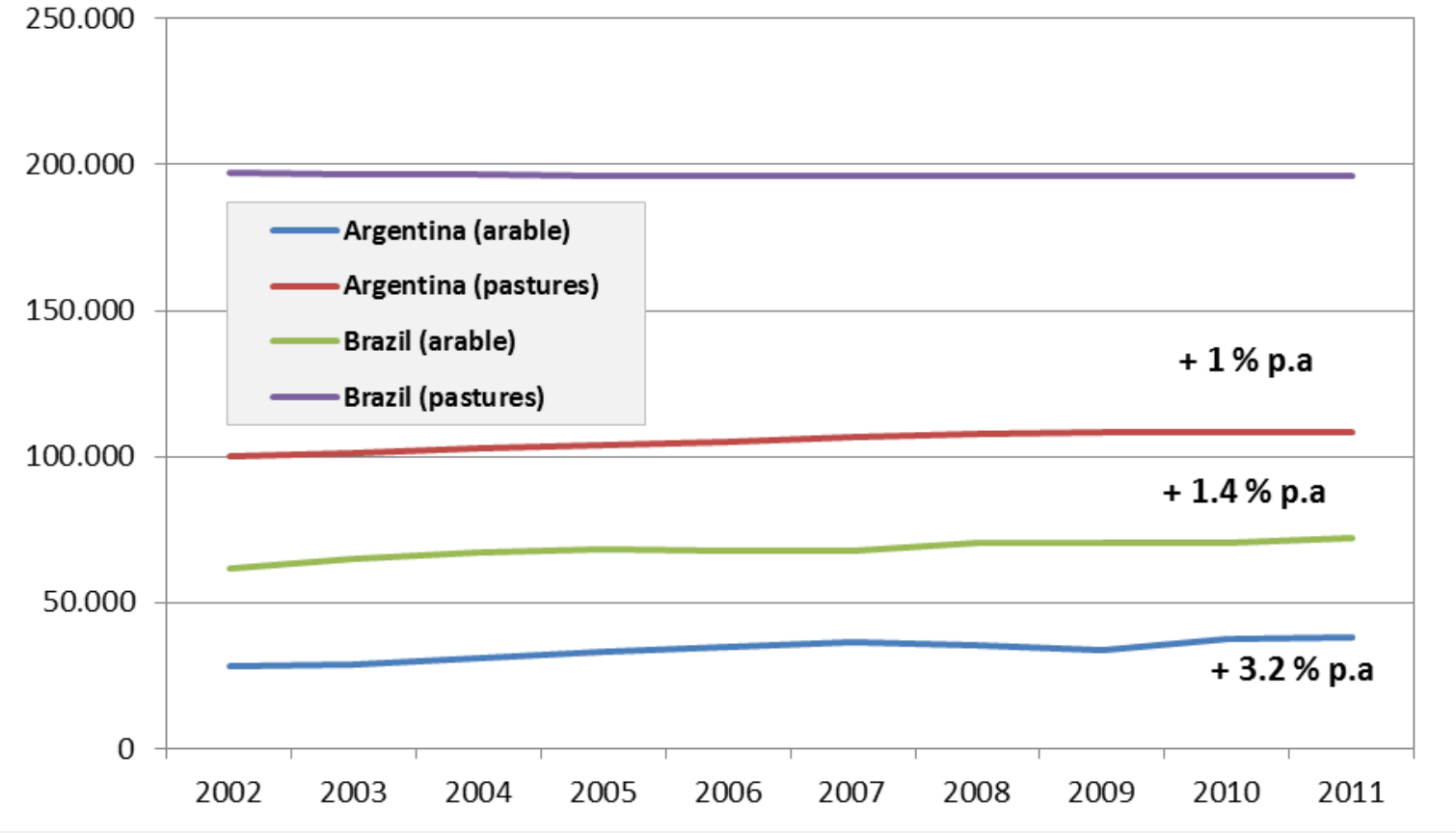
   ⇨ available for (a) land rents to be paid and (b) profits from agricultural production

2. Capital

   a) Fixed assets (e.g. machinery, buildings, installations)

   b) Current assets (e.g. seeds, feed, fertilizers, live animals)

Pasture & arable land use in Argentina & Brazil (1,000 ha)



On the national level hardly any shift

Source: FAO (2014)

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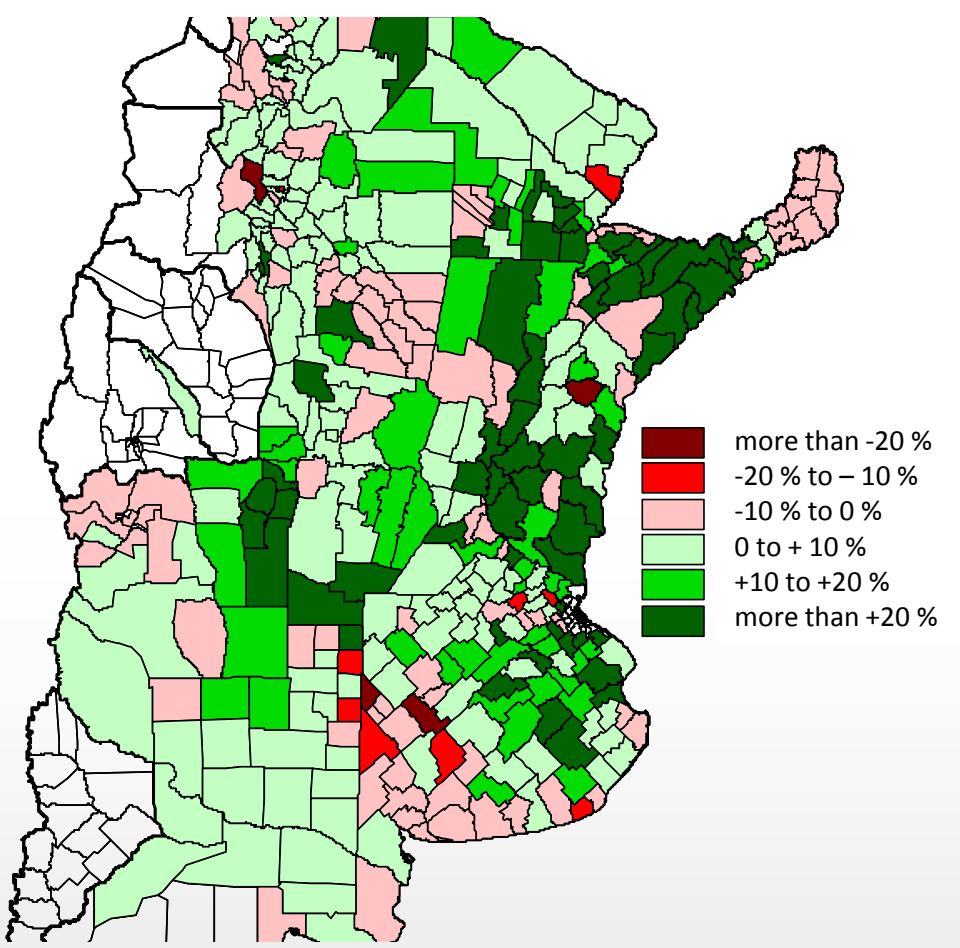
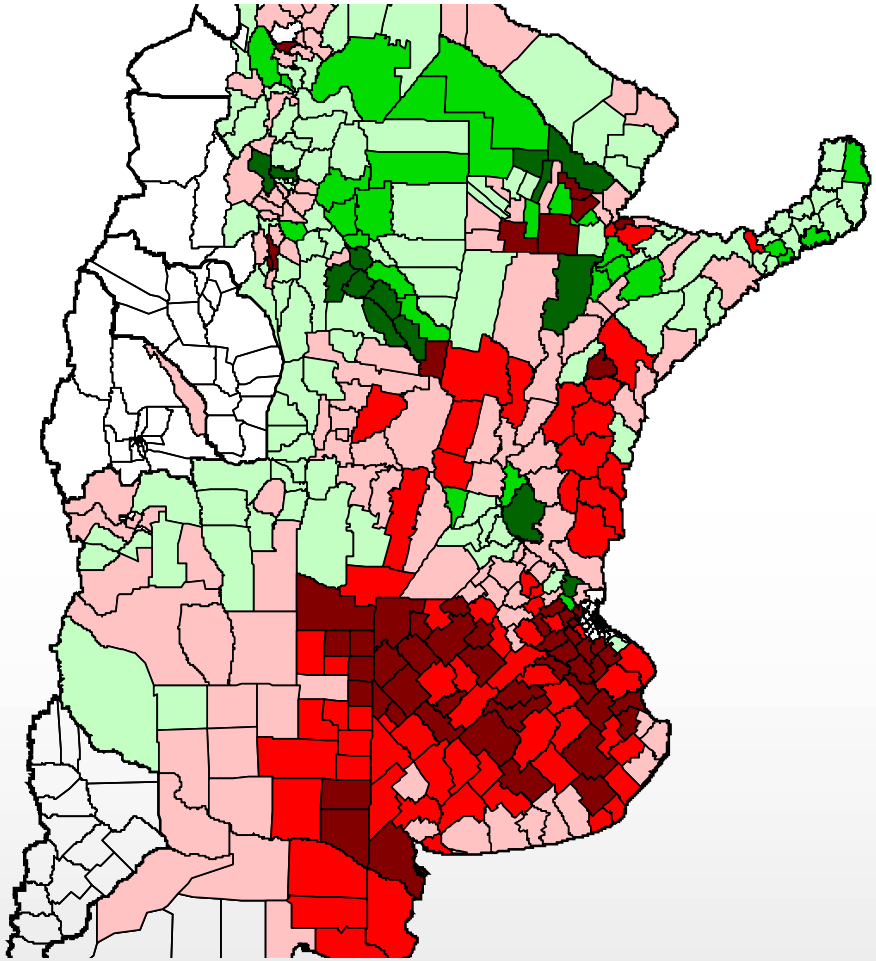
Change of cattle stocks in Argentina



Change 2003 vs. 2006



Change 2006 vs. 2009

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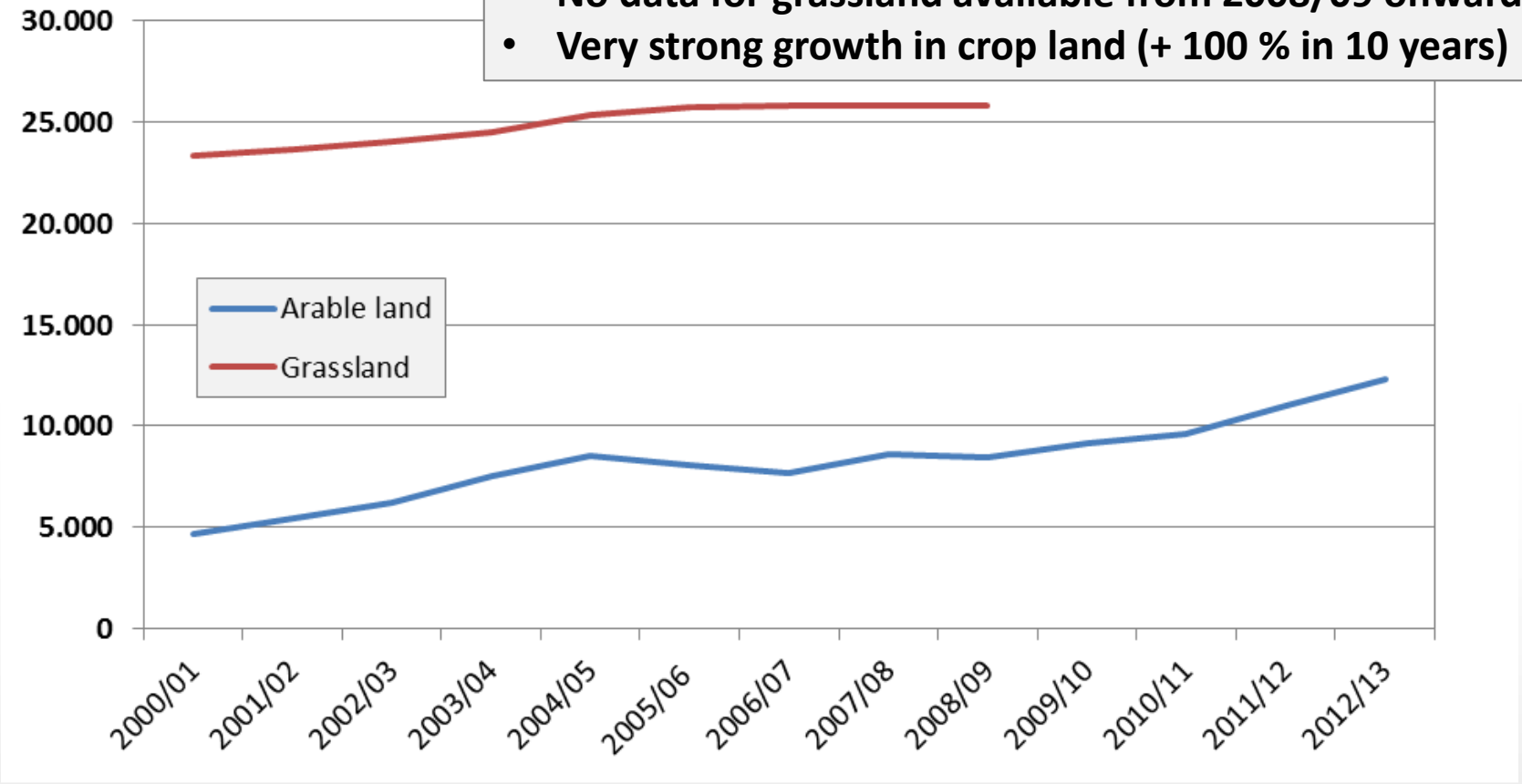
Evolution land use in Mato Grosso (Brazil)

- No data for grassland available from 2008/09 onwards
- Very strong growth in crop land (+ 100 % in 10 years)



Source: CONAB (2014)

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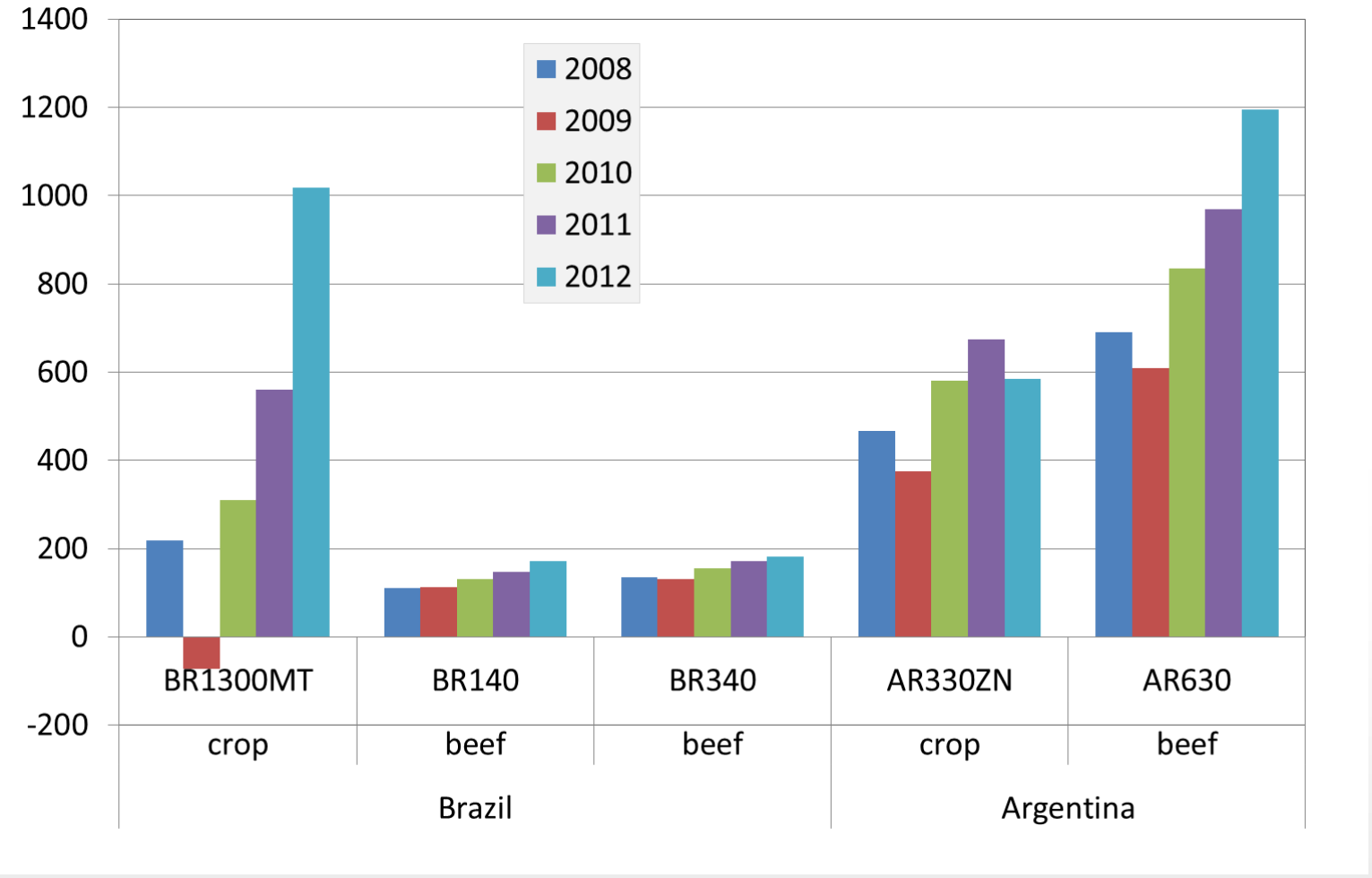
The case studies in BR and AR – Crop farms

	BR1300MT	AR330ZN
Location	Mato Grosso	Zona Nucleo (Buenos Aires)
Annual precipitation	1,400 mm	970 mm
Size of the farm	1,300 ha	330 ha
Yield levels (Corn)	5,5 t/ha	9,5 t/ha
N-input (kg/ha)	50 kg/ha	90 kg/ha
Tillage systems	no-till	no-till
Share double cropping	40 %	25 %
Mechanization	own	contractor

The case studies in BR and AR – Beef farms

	BR-140	BR-340	AR630
Location	Mato Grosso	Mato Grosso	Zona Nucleo (Buenos Aires)
Annual precipitation	2,000 mm	2,000 m	
Finished animals	140 steers	340 steers	377 steers, 255 heifers
Feeding system	grass	grass	grains
Land use	pasture only	pasture only	pasture & crop

Return to land – crop vs. beef farms in AR & BR



Source: *agri benchmark* Cash Crop / Beef (2014)

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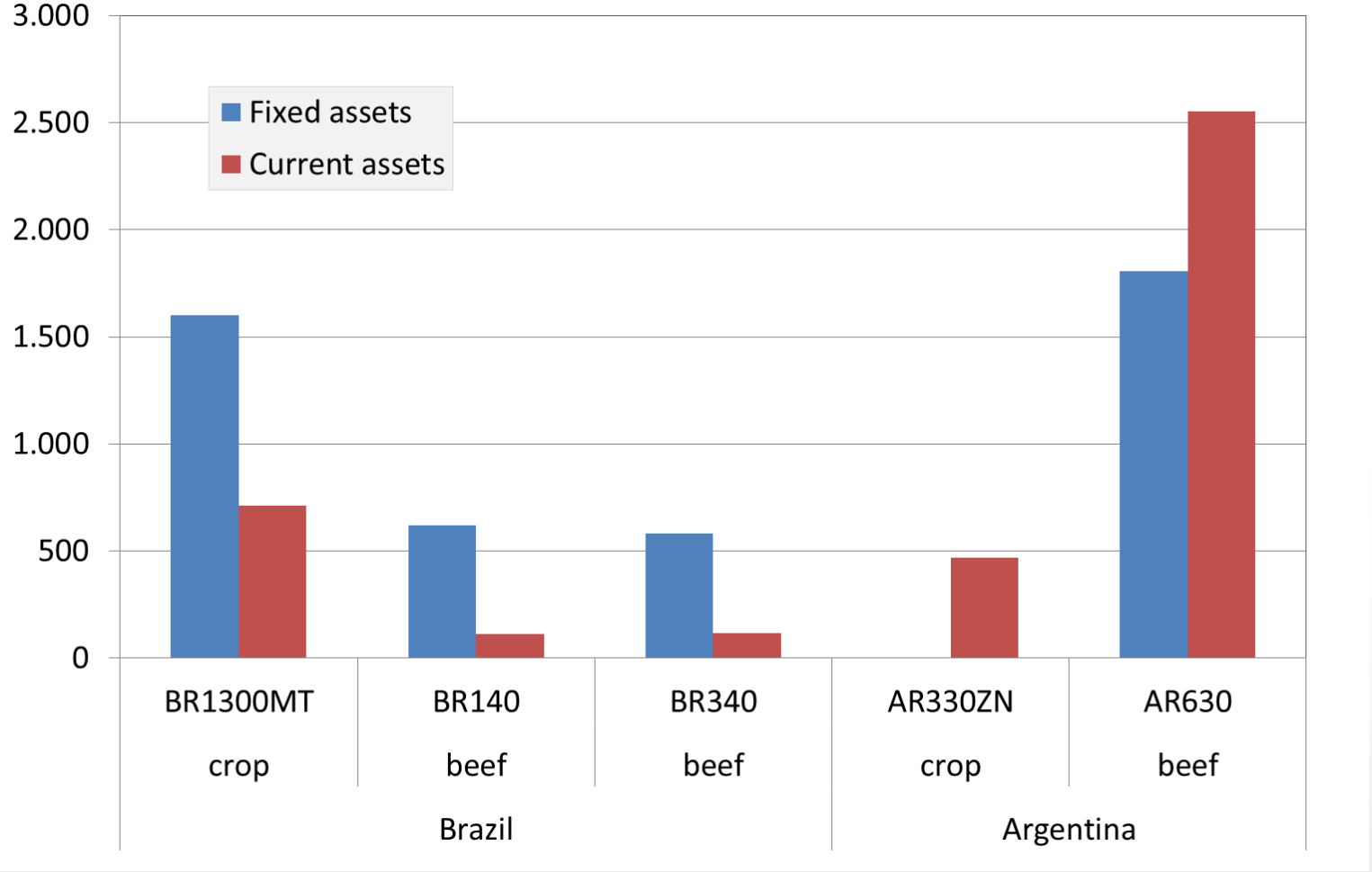
Conclusions

1. In BR with a grass-based system the competitive edge of crop vs. beef production has become extraordinary.
2. Even a significant reduction in crop prices will not change the picture significantly.
3. The grain-based beef system in AR is very competitive relative to crop production.
4. When just looking at “return to land” figures, a strong move towards more intensive beef systems can be expected.
5. However, producers are driven by some other factors as well – which will be analyzed below.

Capital needs

1. In many countries, access to capital is a major challenge – plus real interest rates tend to be high.
2. AR: Since contract services are easily available:
   ⇨ no machinery capital required
   ⇨ no reason to not move to crops
3. BR: Depends on crops to grow
   a) Sugar cane – land lease to cane factory requires no investments in machinery (similar as AR)
   b) Corn / soybeans: Major investments in machinery, current assets and buildings required

Capital needs in BR & AR beef and crop farms (USD/ha)



Source: *agri benchmark* Cash Crop / Beef (2014)

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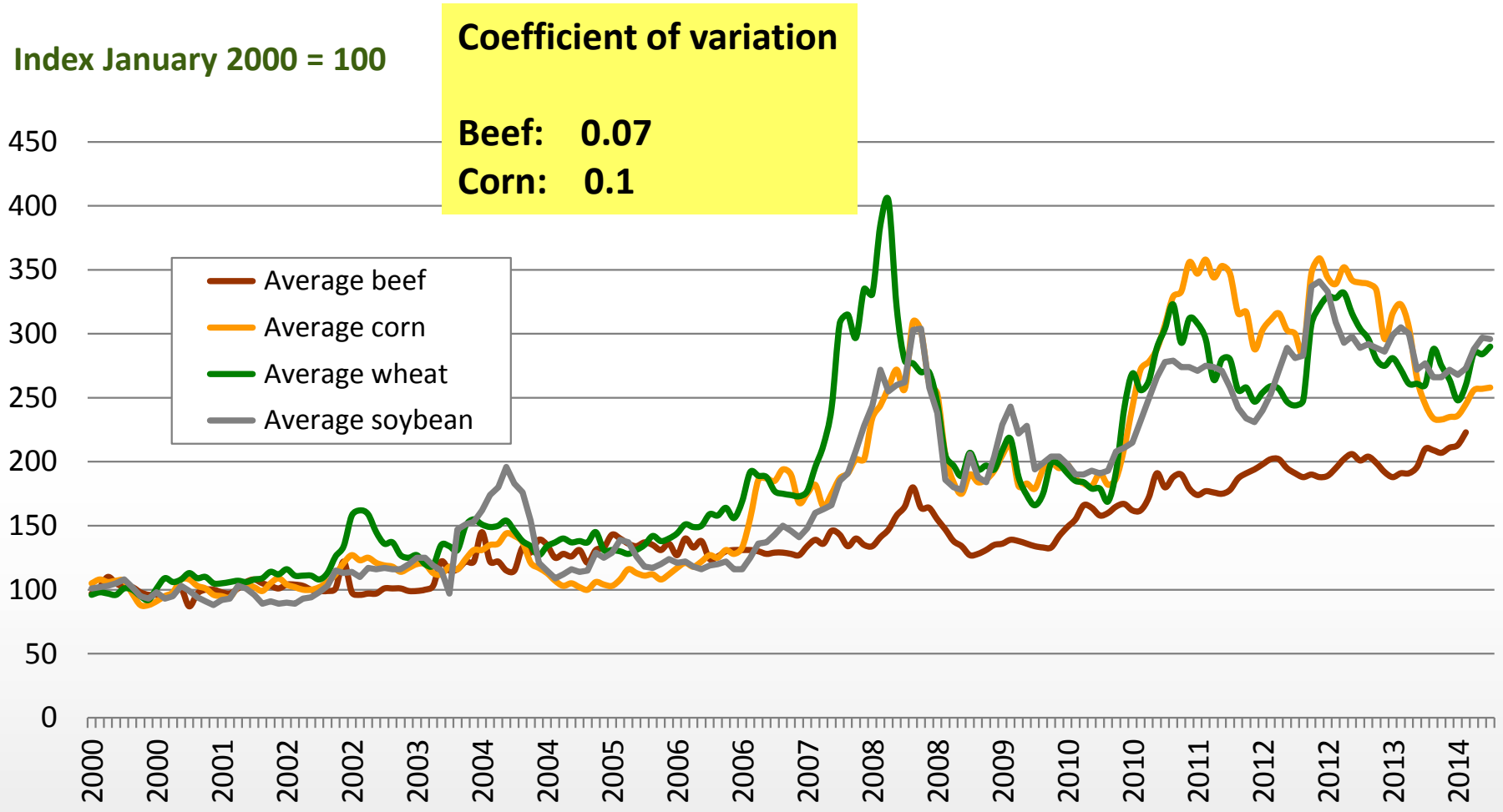
Crop prices increased stronger than beef prices – but: volatility in crop prices is higher too



Source: FAO Price data base http://www.fao.org/economic/est/prices

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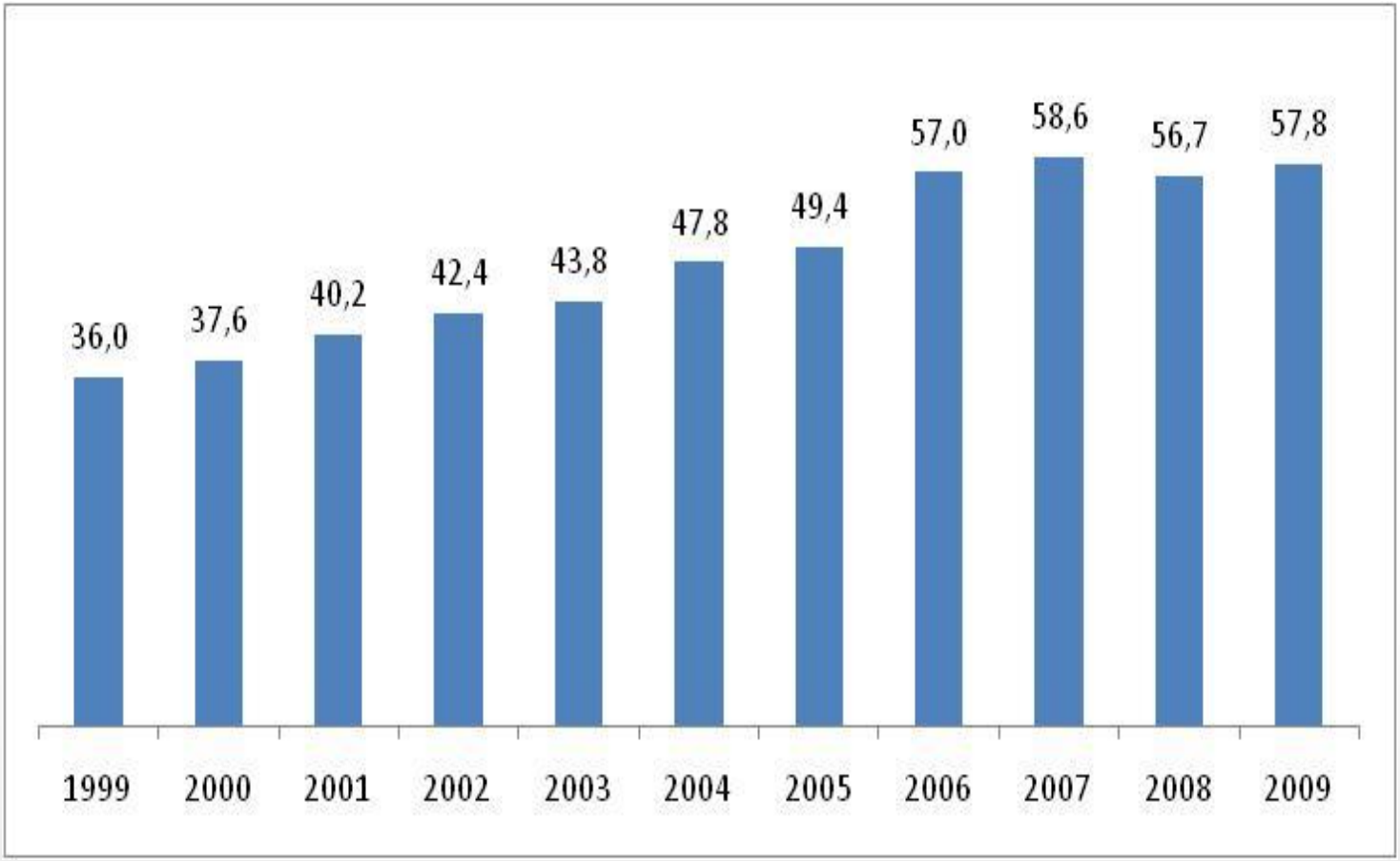
Brazilian beef productivity (kg carcass weight/ha)



Source: FAO

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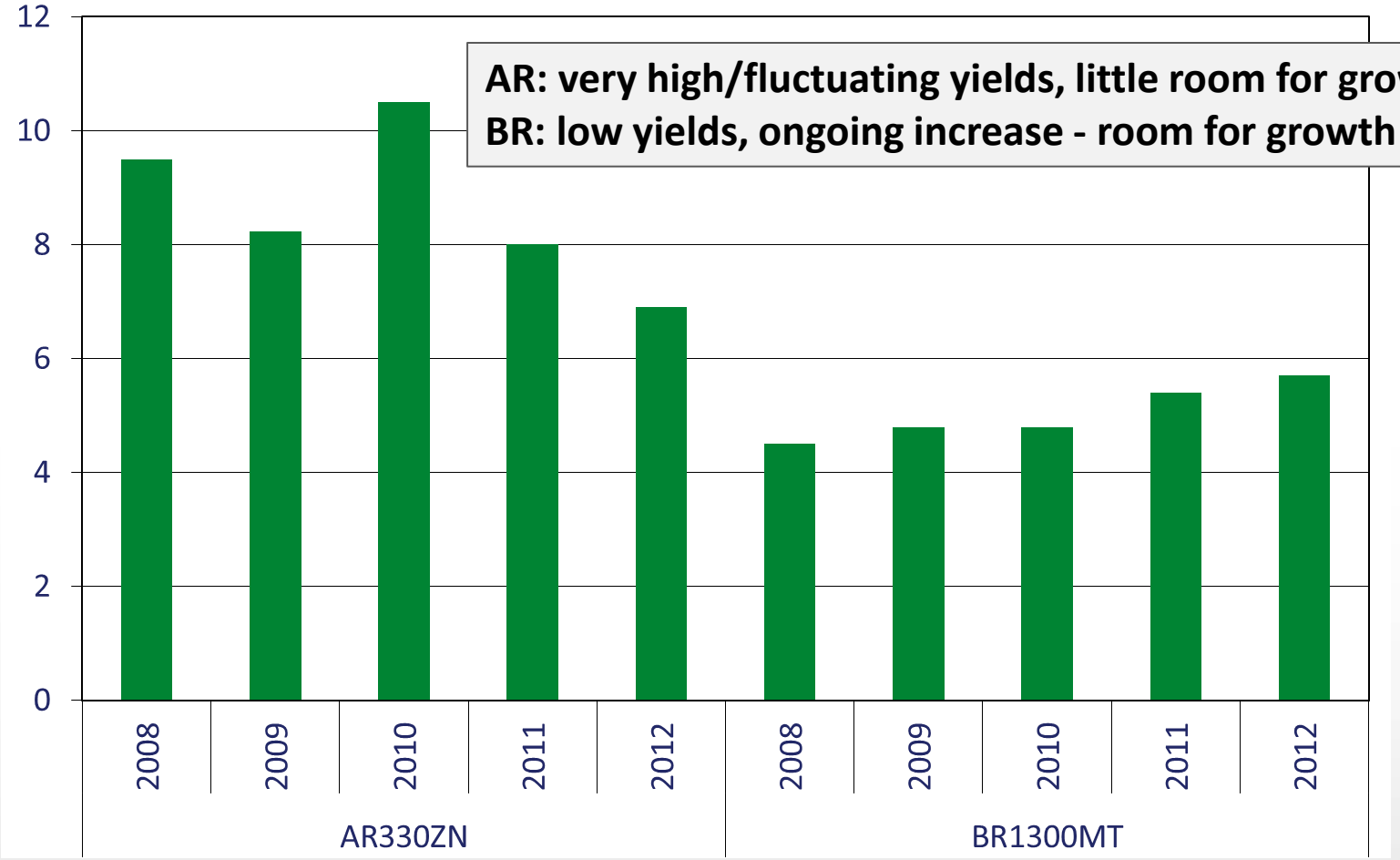
Evolution of corn yields on AR & BR farms (t/ha)



Source: *agri benchmark* Cash Crop (2014)

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Conclusions re. Brazilian grass-based systems

1. We only have a limited number of data points yet – therefore subsequent conclusion are indicative only.
2. Under recent price-cost ratios grass-based beef systems relative to crop production seem to be not competitive on land markets.
3. With productivity growth in crop production, current competitive disadvantage of grass-based beef is likely to become worse.
4. Crop production implies more volatility in prices – hence stronger market risks.
5. A move from grass-based beef production to crop production implies a strong increase in capital needs.

Conclusions re. Argentinian grain-based systems

1. Grain based beef production is very competitive rel. to crops.
2. But: capital requirements are much higher than in crops – in particular when using contractor services.
3. Given high yield levels in crops, a change of the picture is rather unlikely.
4. The second strategic “pro” for beef in Argentina:
   Beef can be used as a substitute for a bank deposit.

First attempt to generalize conclusions

1. Provided the conversion of grassland to crop land is technically and legally possible crop land seems to have a competitive edge in the long run.
   Caveat: No dramatic downturn in crop prices will take place.

2. To what degree this will lead to
   ⇨ an intensification in beef [feedlot] or
   ⇨ a re-allocation of beef depends on
      i. the availability of additional land resources and
      ii. access to finance/real interest rates.

3. The more land available and the tighter capital markets, the more beef will move to new grassland. With less land and easy access to capital beef production will be intensified.

Thank you for your interest in *agri benchmark*.

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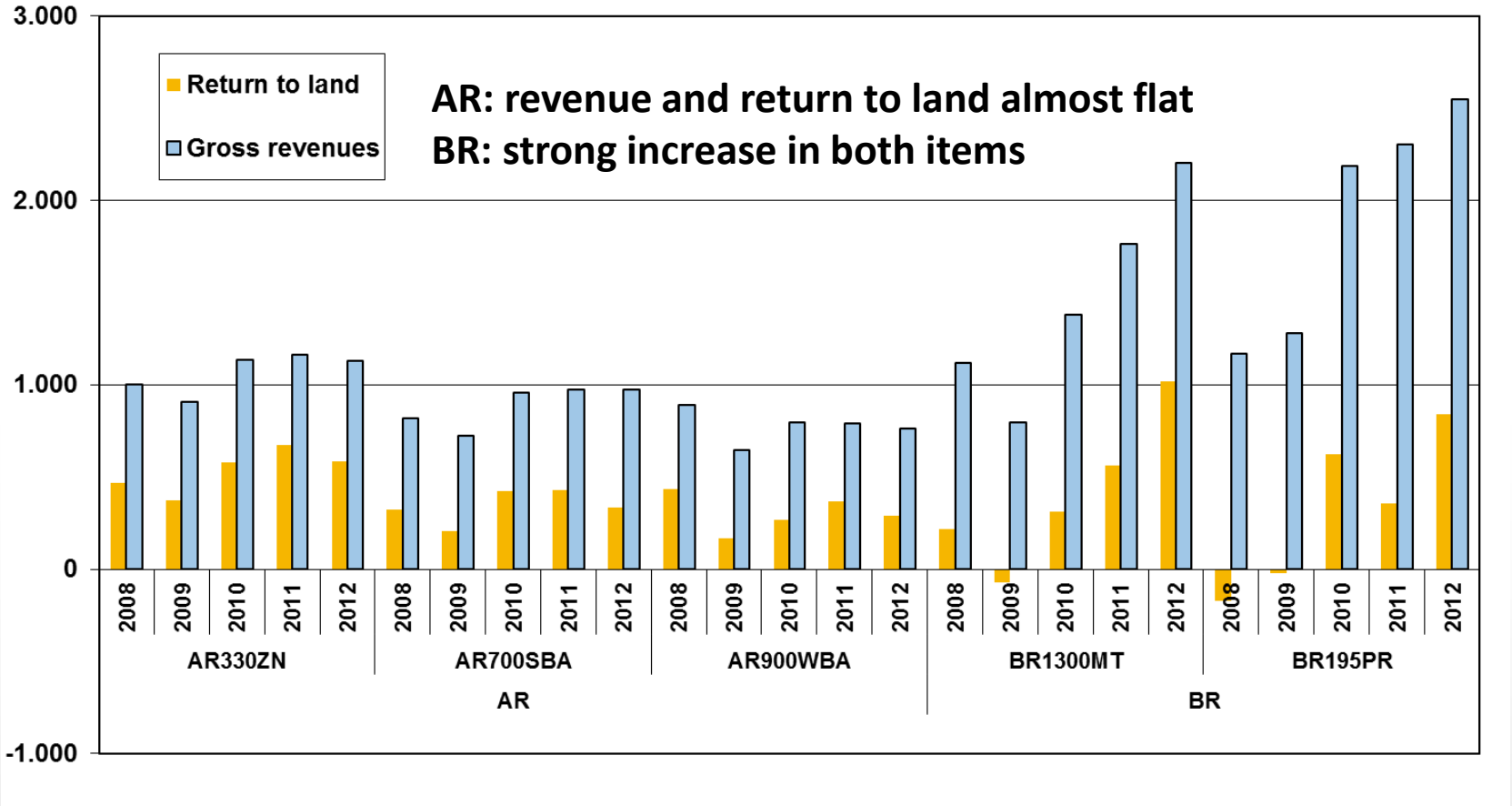
Revenues & return to land for AR & BR crop farms



Source: *agri benchmark* Cash Crop (2014)

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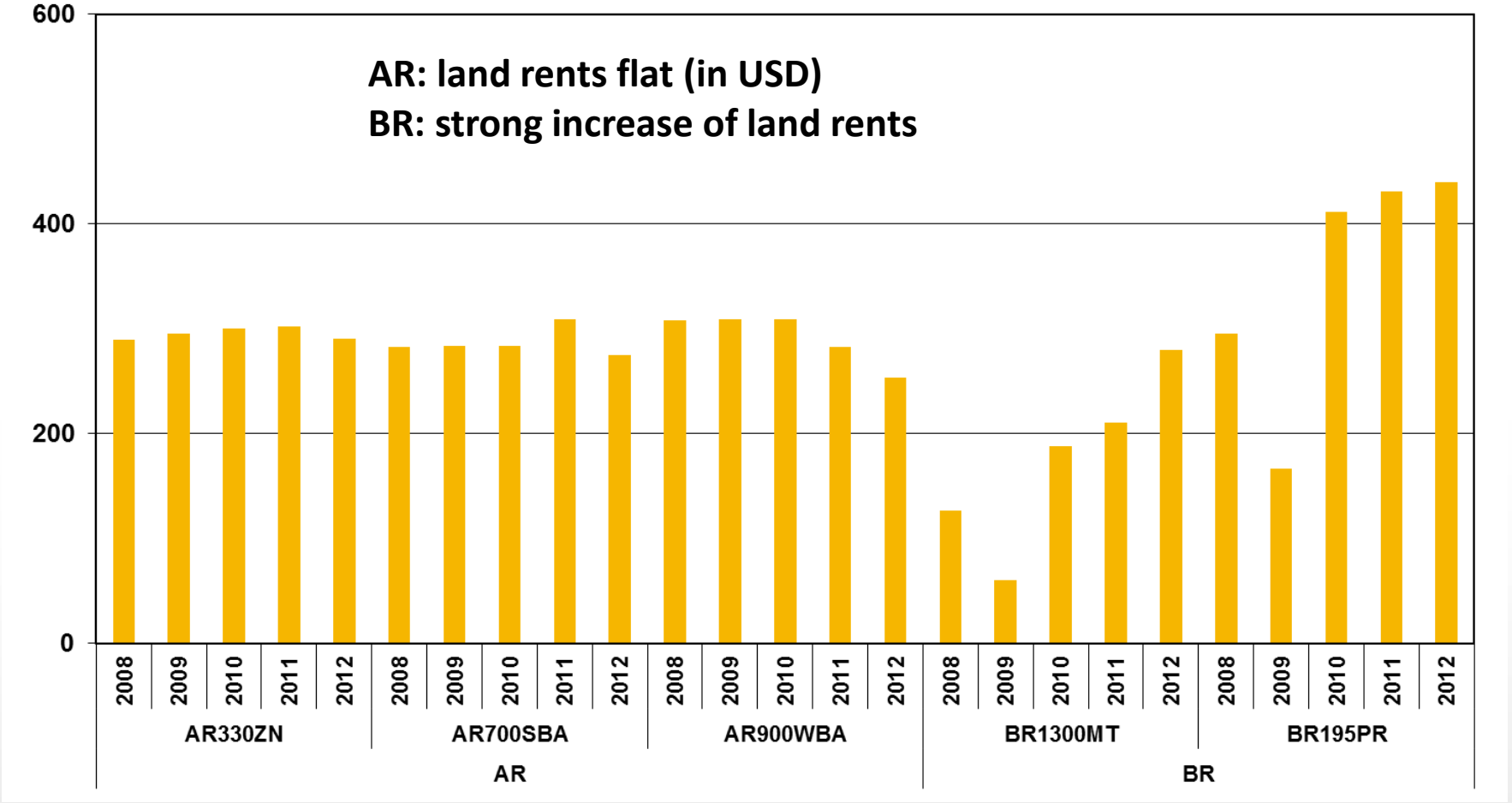
Data on crop farms

	Ø Soy yield (t/ha)	Ø Soy price (USD/t)	Ø Corn price (USD/t)
BR1300MT	3.4	340	128
AR330ZN	3.3	250	130

Source: *agri benchmark* Cash Crop (2014)

Land rents for AR & BR crop farms



Source: *agri benchmark* Cash Crop (2014)

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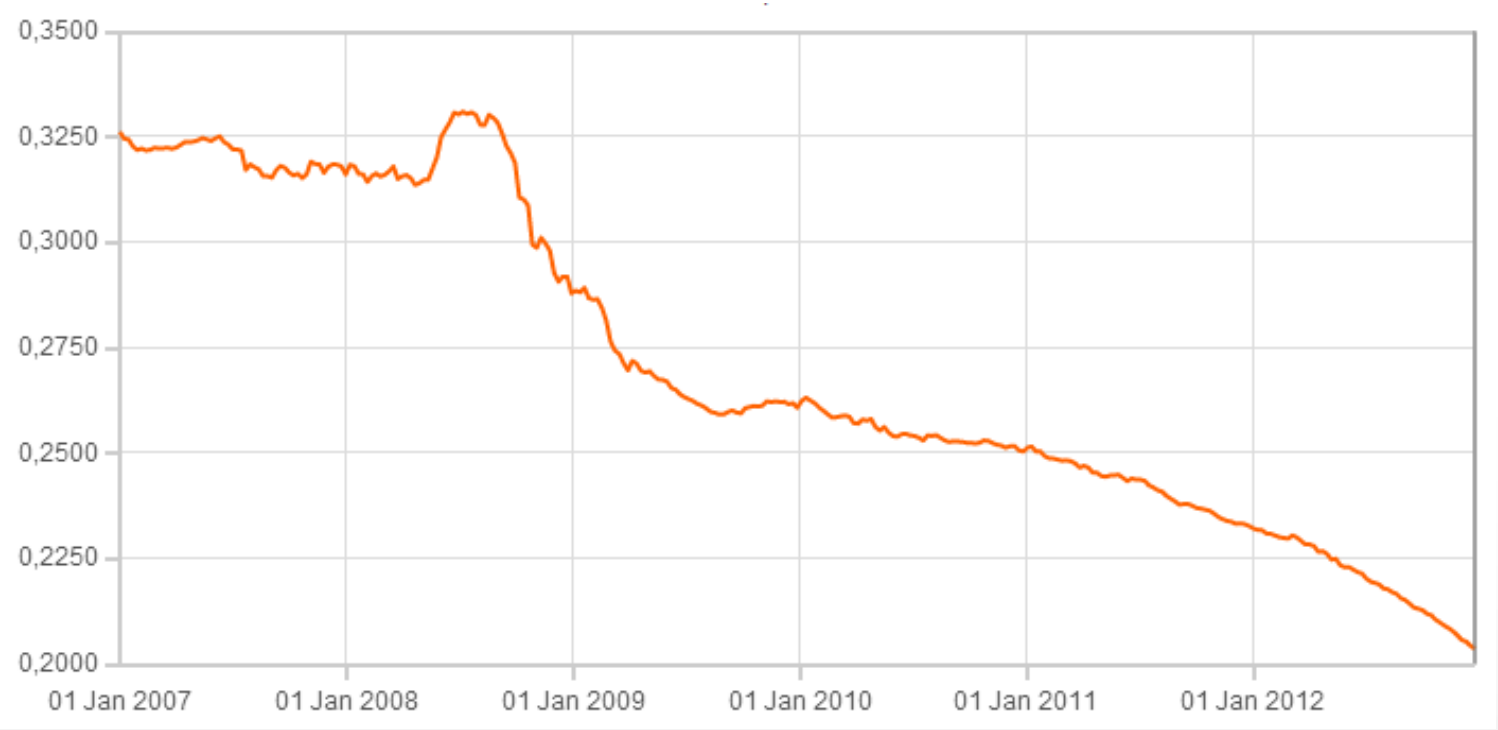
Evolution of exchange rate AR Peso vs. USD



Strong devaluation of Peso against USD: - 38 %

Source: Oanda (2014)

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Evolution of exchange rate BR Real vs. USD

High fluctuation of Real, but on average relatively stable

Source: Oanda (2014)

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