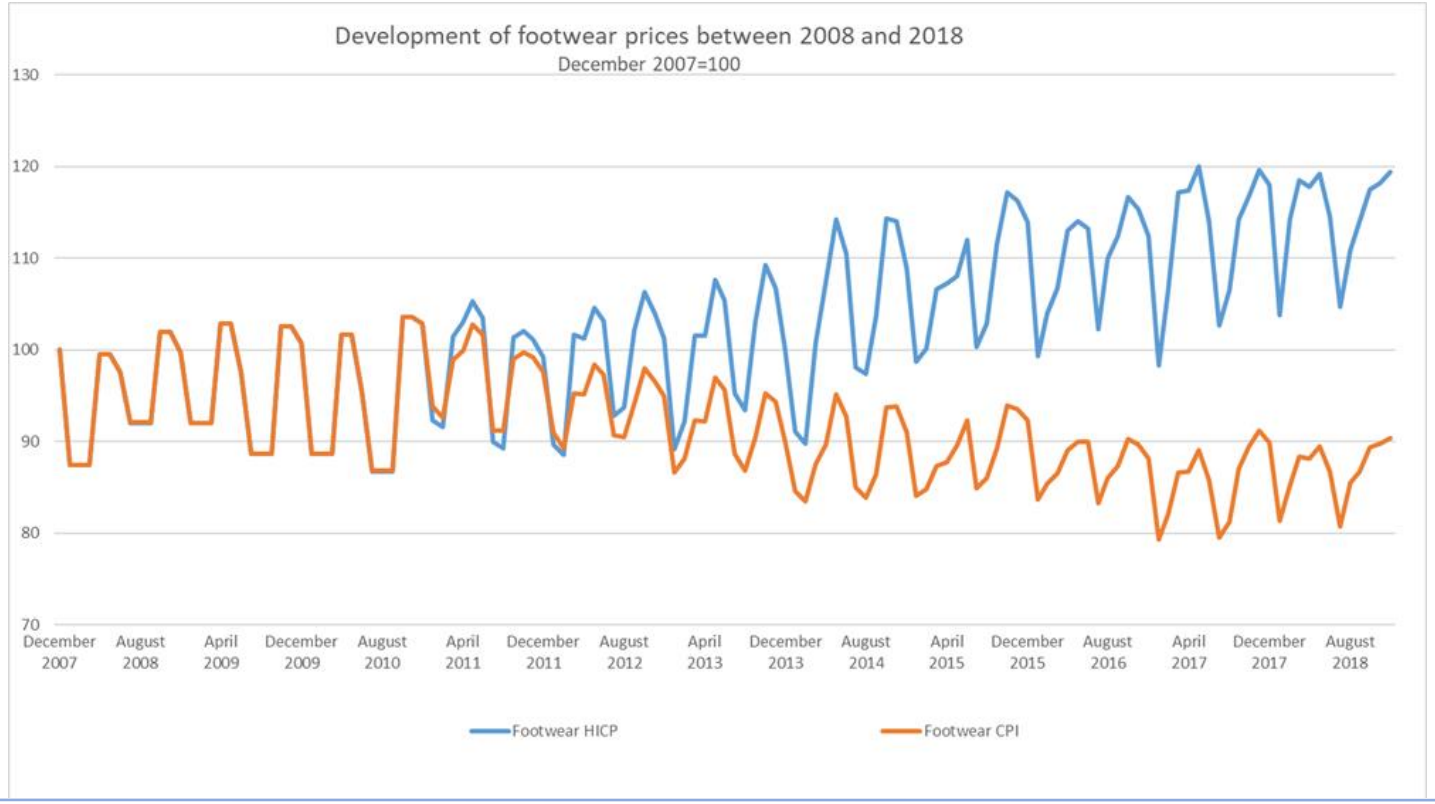
Pricing seasonal products: imputation techniques

Meeting Ottawa Group – Rio de Janeiro 2019

The starting point of this paper

+ 20% or -10% ?



True price change in 10 years ?

Shoes sold in Switzerland are imported.

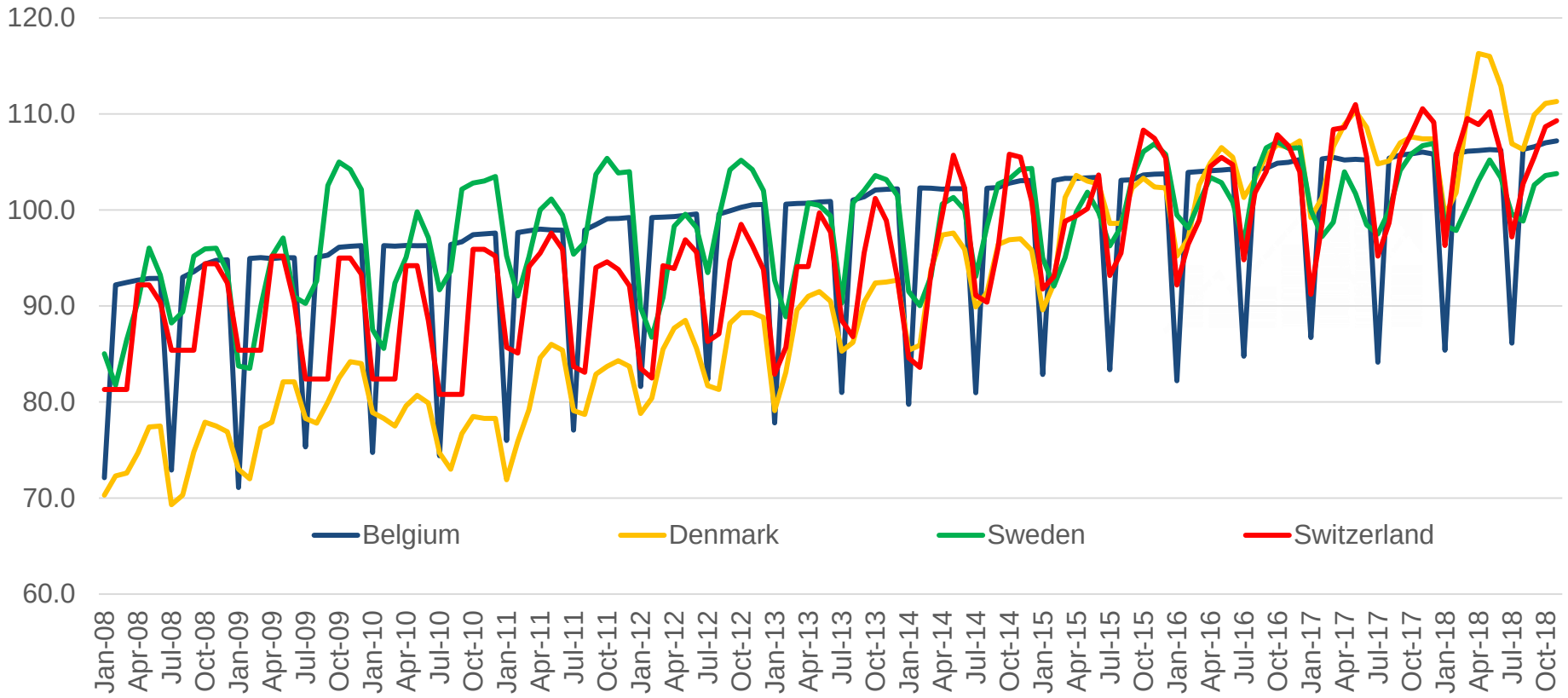
Increase of the Swiss franc since 2009

Imports should be cheaper.

Swiss IPI : - 7.7%

Swiss PPI : - 3.6%

Price change in Europe in the last 10 years?



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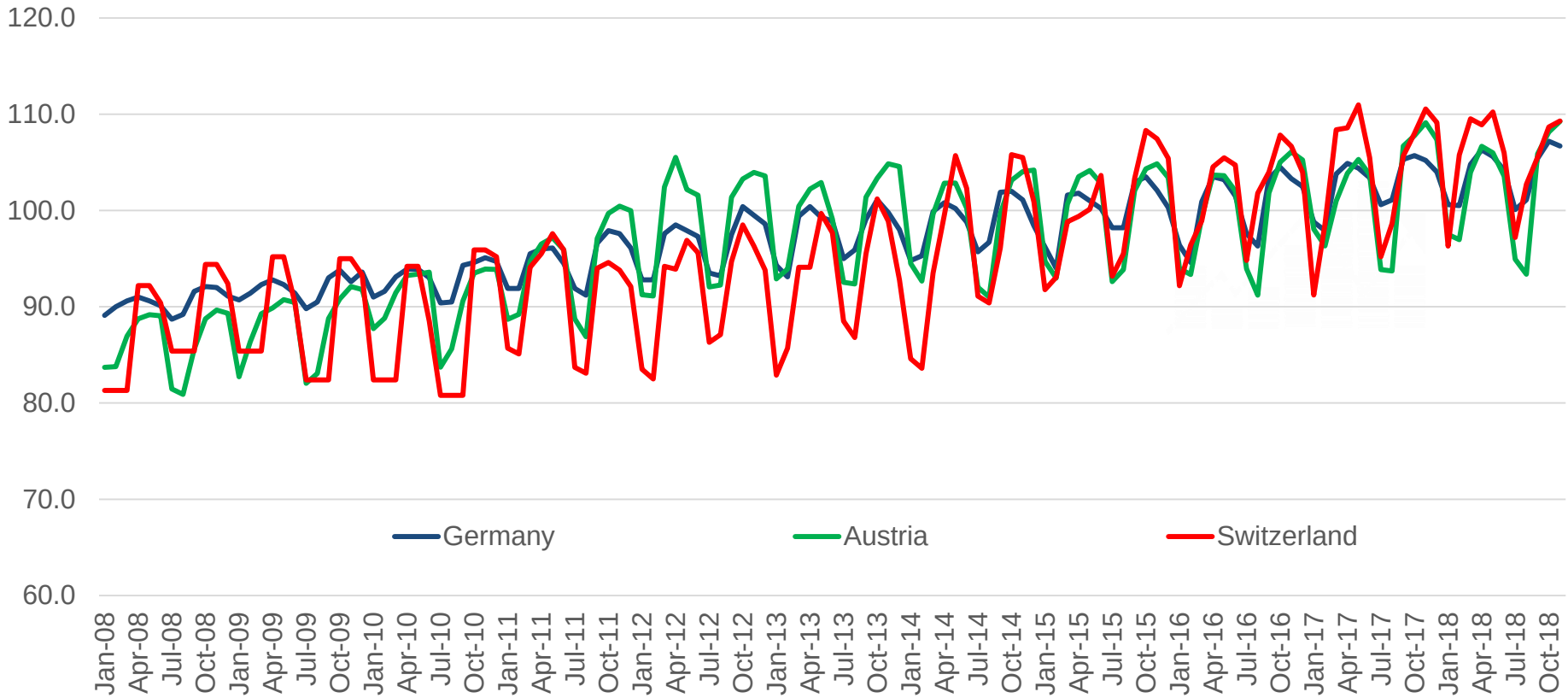
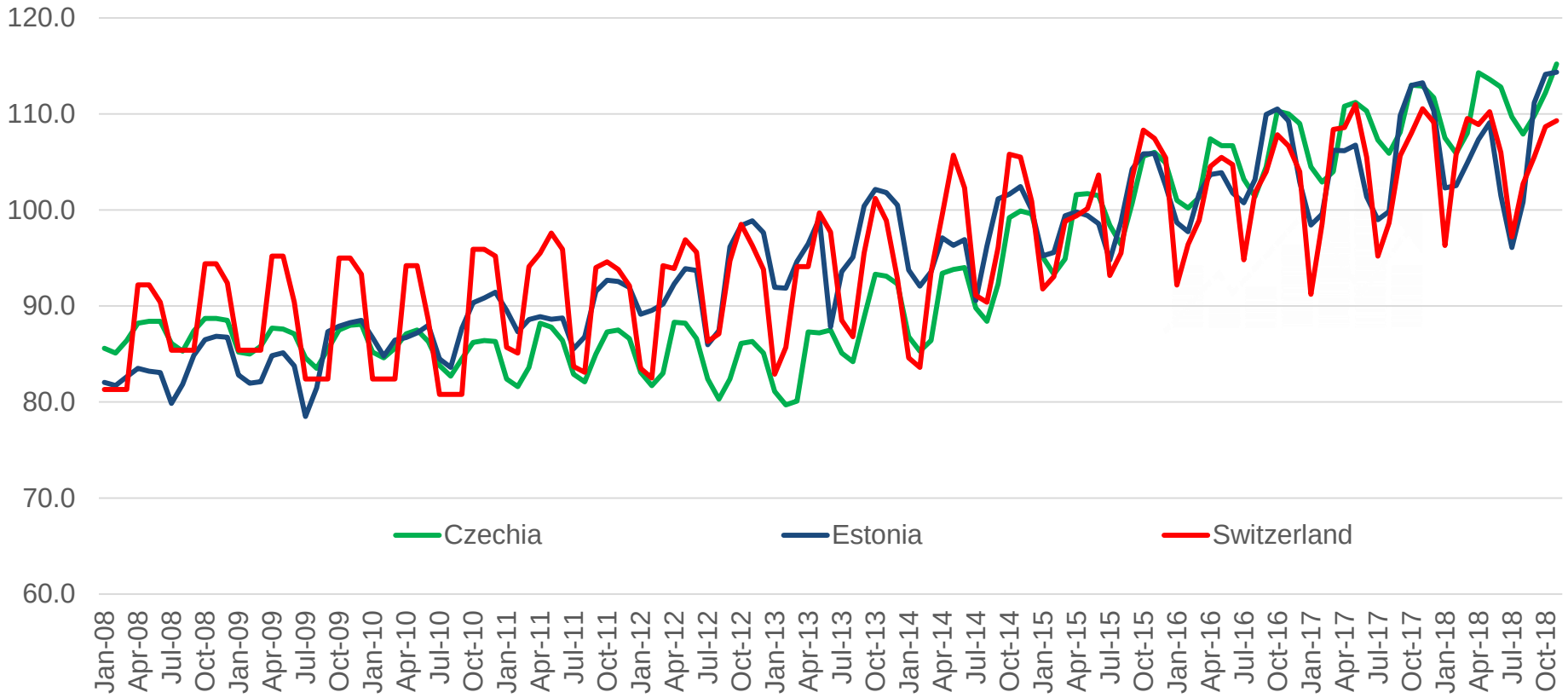
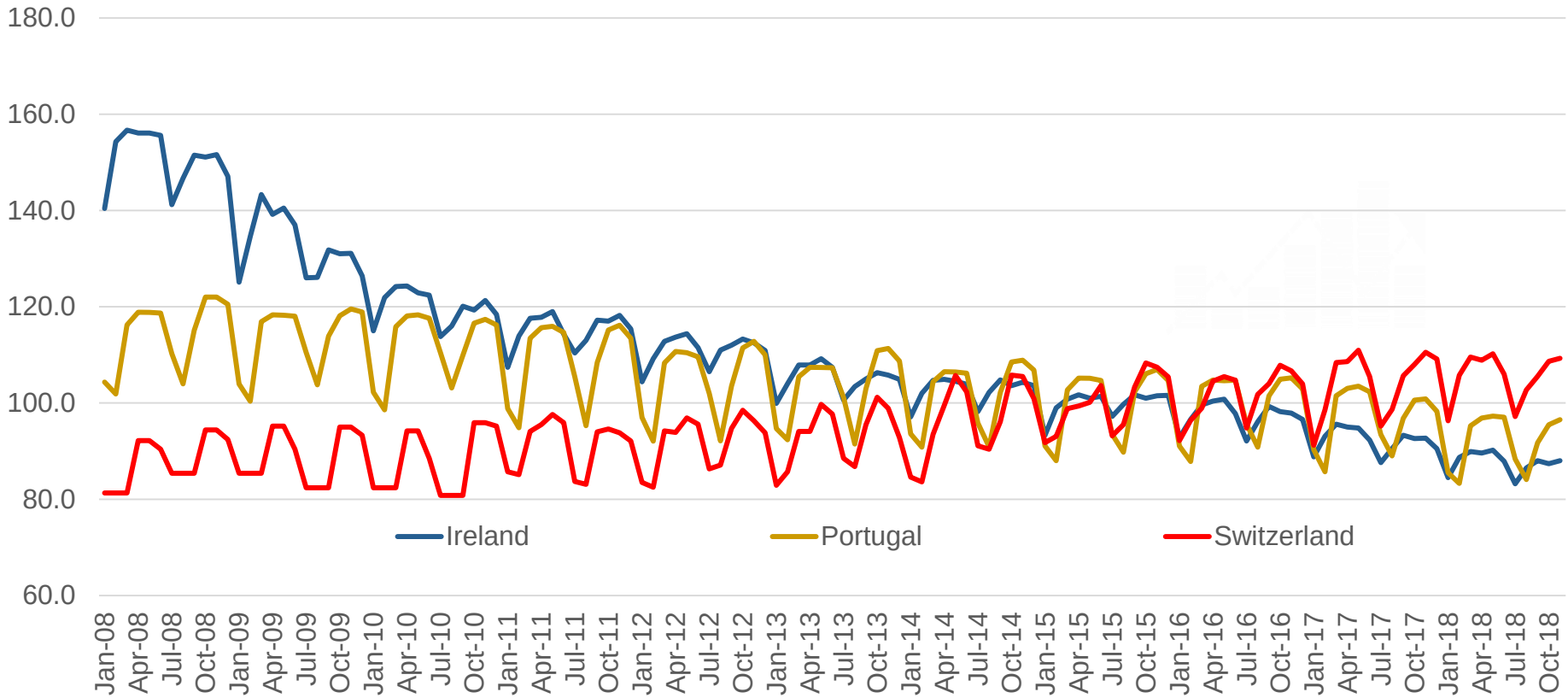


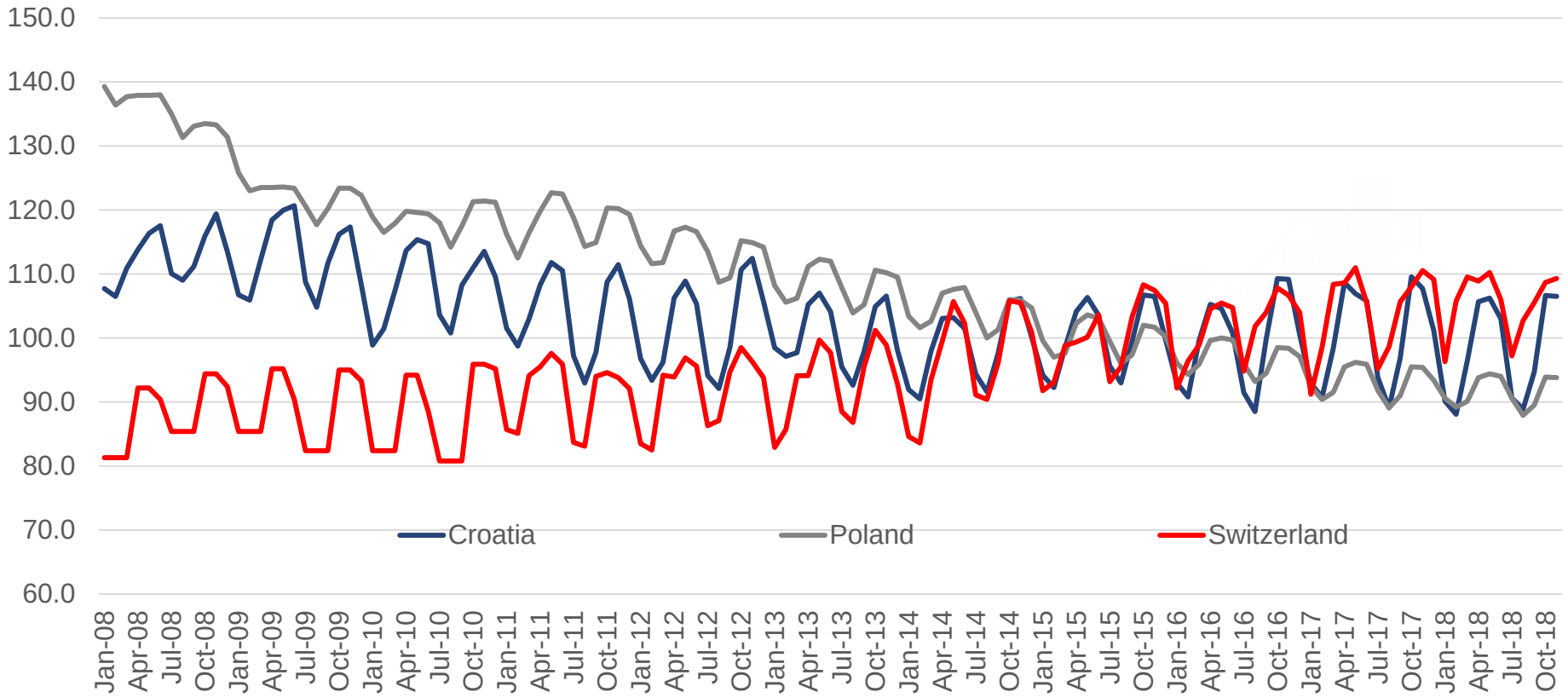
Price change in Europe in the last 10 years?



Price change in Europe in the last 10 years?



Price change in Europe in the last 10 years?



Three questions to be anwered when facing seasonality

1. What do you do when the season ends ?

- ❑ Carry forward the last collected price
- ❑ Bring back to a «typical» normal price (HICPs)
- ❑ Directly impute the price change of other items in the same elementary product groups : all season, counter seasonal, all year.

Three questions to be anwered when facing seasonality

2. What do you do until the season reappears ?

- Impute a zero price change
- Impute the price change of other items in the same elementary product groups : all season, counter seasonal, all year.

Three questions to be anwered when facing seasonality

3. What do you do when the season reappears ?

- Collect and register the price in season, which usually corresponds to the arrival of new collections (high price level)

The carry forward technique smooths the volatility

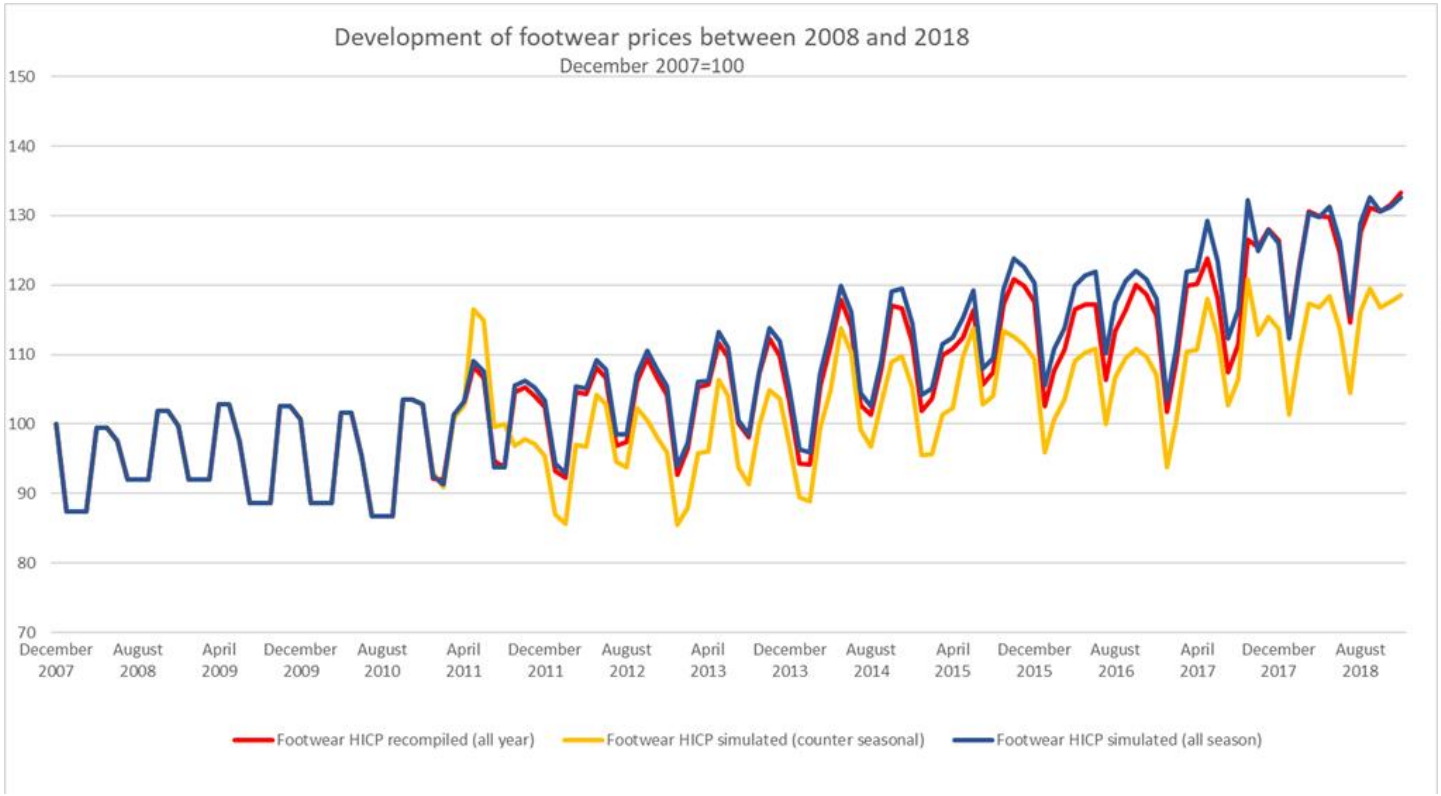
	December	January	February	March
EA 1 all year	100	50	50	120
EA 2 all year	100	60	50	110
EA 3 winter	100	60	50	100
EA 4 summer	100	100	100	100
EA 5 summer	100	100	100	100
Total		71.0	66.0	105.7

Carry forward method

A lower number of imputation during the sales period combined with a higher number of imputation during the new collections period (price increase) tends to drive the results down

and vice versa

What about the other imputation methods? Any trend ?



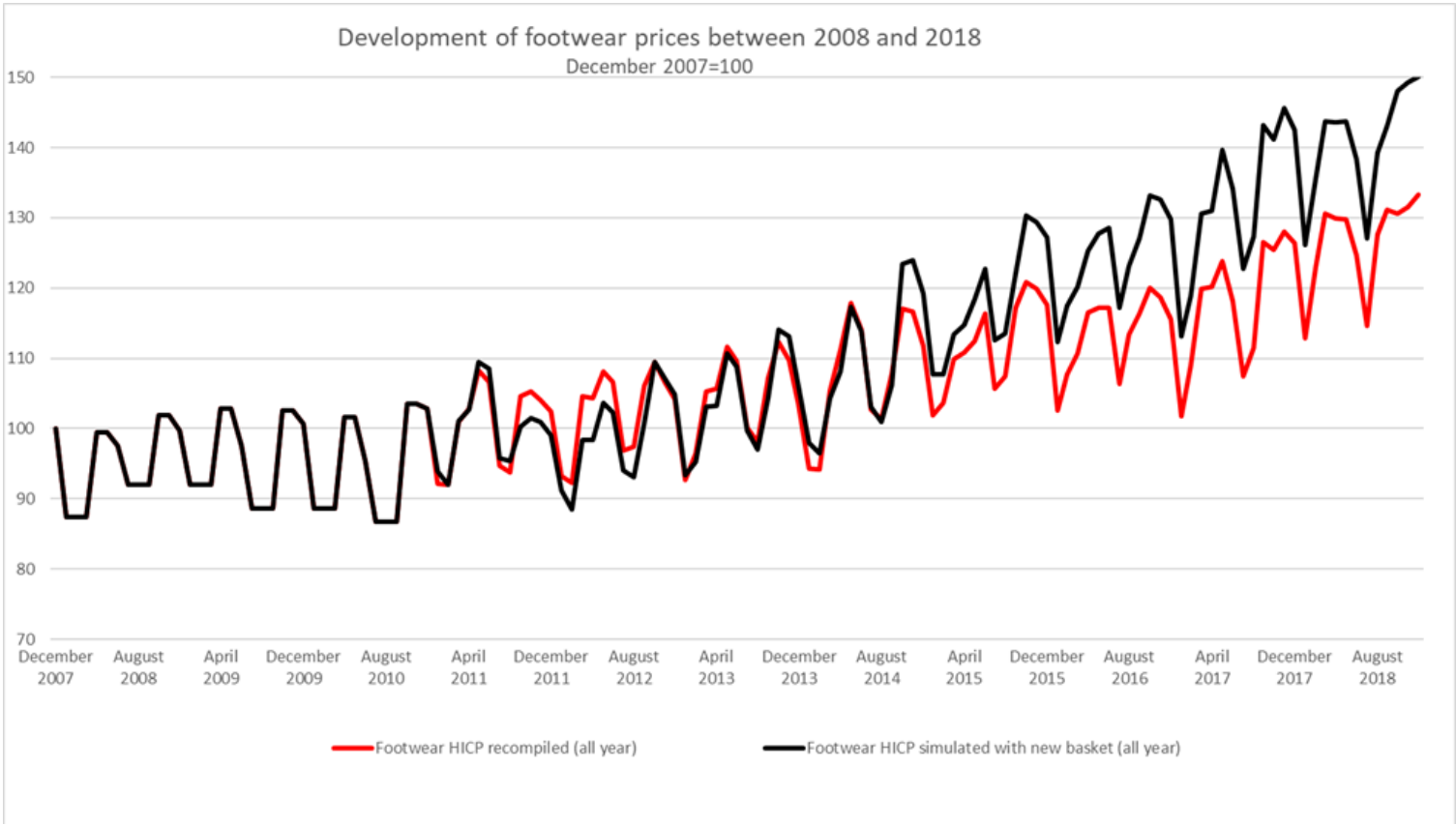
What about the other imputation methods? What is right ?

Impute sandals with winter boots, or with high heel shoes, or with all available shoes ?

What appears in the simulations is that the results differ mainly between the counter-seasonal technique and all-season technique

Thus, if two countries recorded the same prices but applied a different imputation technique, the results would be different.

Another basket, other results



Another basket, other results

Thus, if two countries recorded the same prices, applied the same imputation technique, but had a different basket, the results would be different.

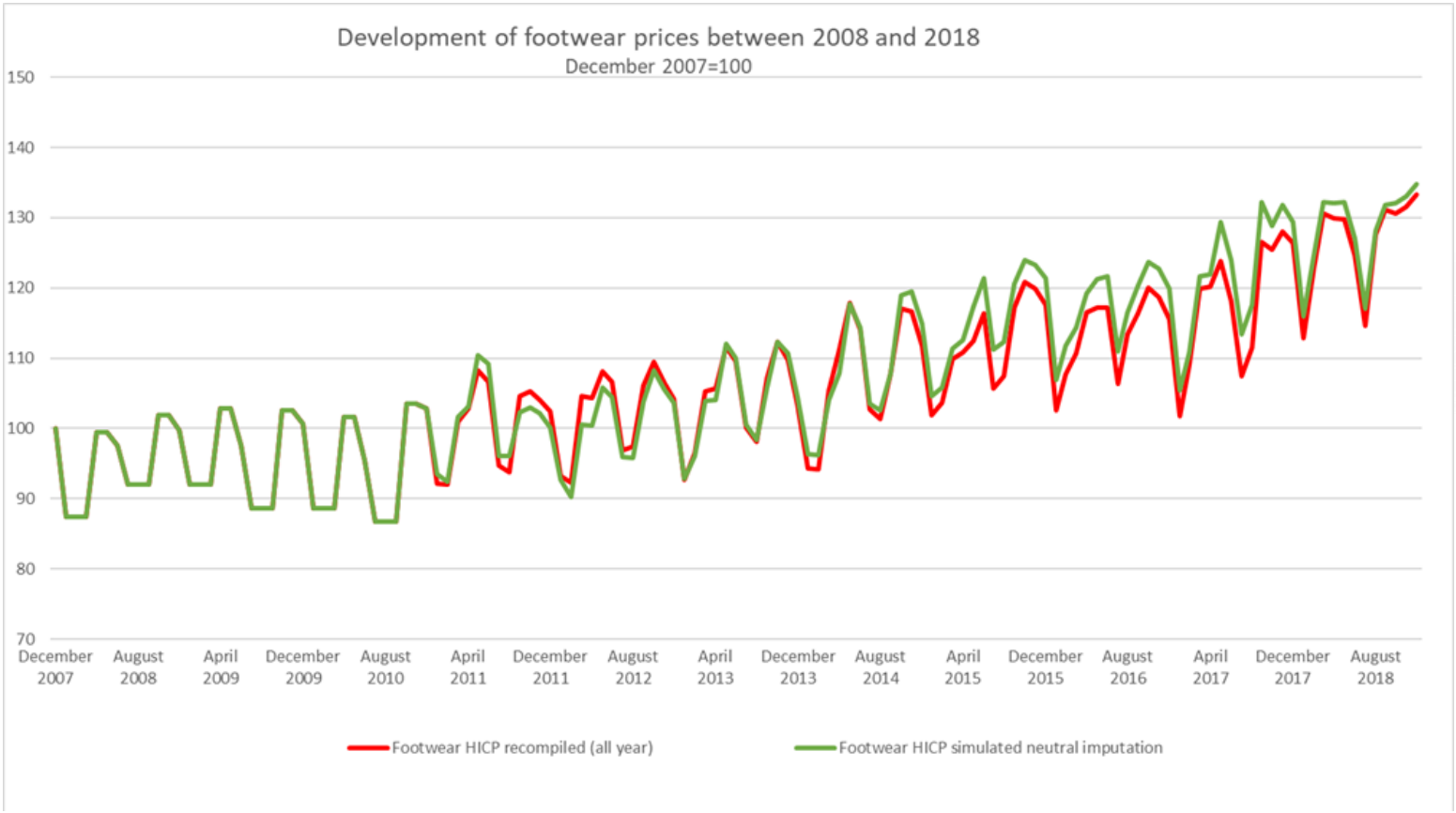
What is the ideal imputation ?

An imputation that does not have an impact on the results

If you compile the index with seasonal products, the results would be the same

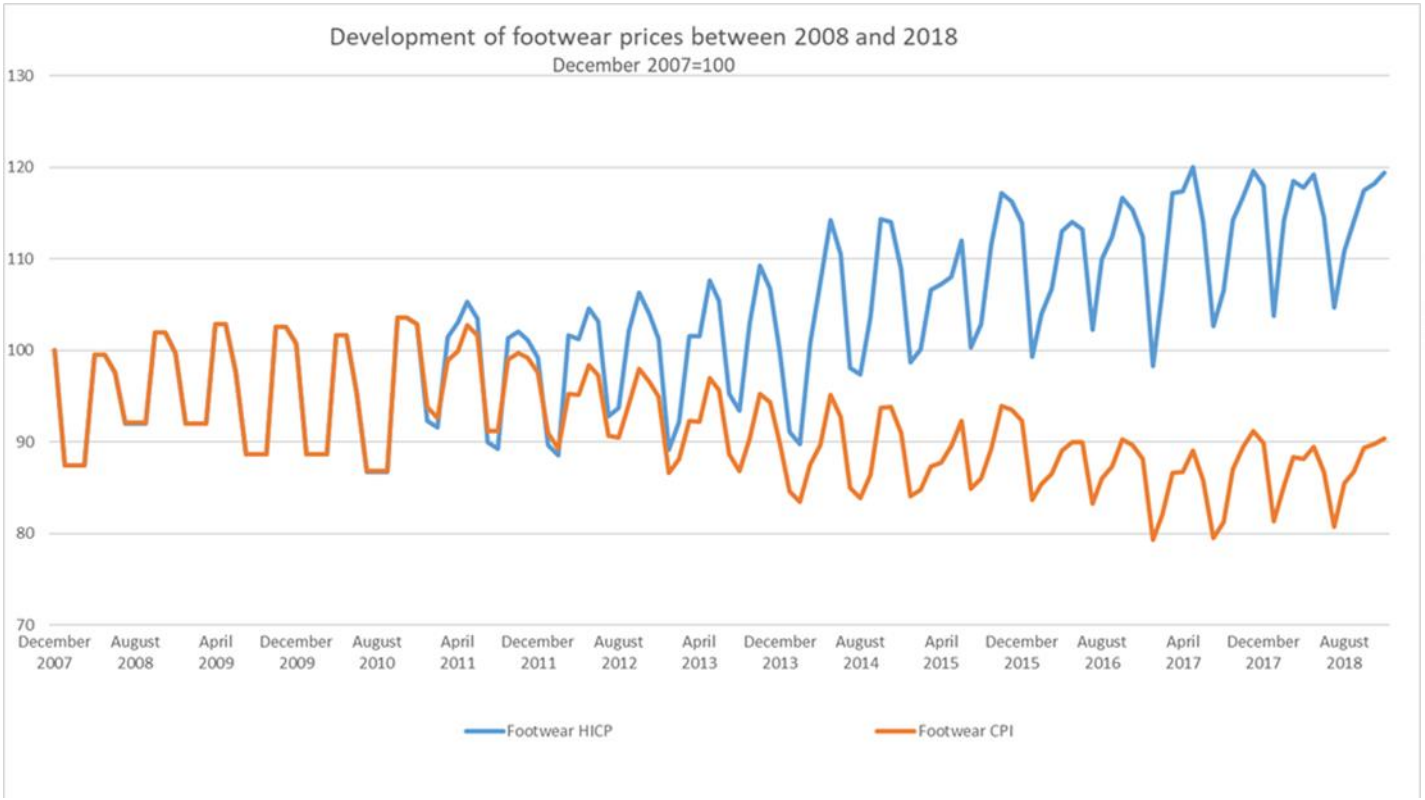
We will call it the neutral imputation technique

What is the ideal imputation ?



But perhaps you have an important question ?

+ 20% or -10% ?



Remember the three questions…..

We talked about what to do when the season ends and until the season reappears. But we didn't talk about what to do when the season reappears.

Our indices are compiled on the basis of collected prices. When the season reappears, the compiled price change is based on the last recorded price, without taking into account the imputations that took place during the off-season.

What's going on…

Position nb.	Description	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2017	2018	2018	2018	2018	2018	2018	2018
		Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Dec (2)	Jan	Feb	March	April	May	June	July
3252	Sandals women	Imputation							Imputation												
								Recorded price change													
																		Validity price change			

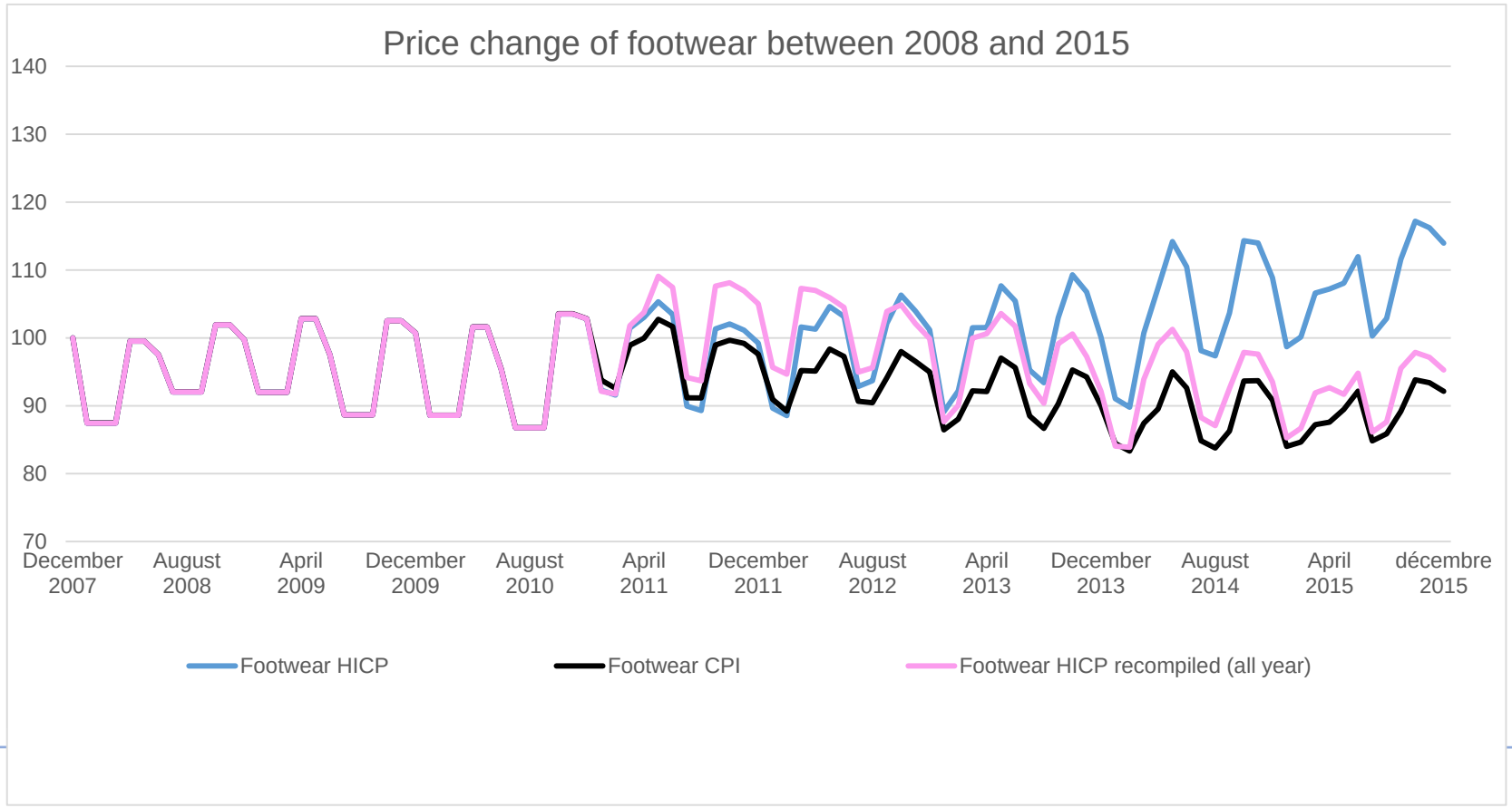
No problem with the carry forward since the previous index is the same in April as in July

What's going on with the HICP

Position nb.	Description	2017 Jan	2017 Feb	2017 March	2017 April	2017 May	2017 June	2017 July	2017 Aug	2017 Sep	2017 Oct	2017 Nov	2017 Dec	2018 Jan	2018 Feb	2018 March	2018 April	2018 May	2018 June	2018 July
3252	Sandals women	Imputation						89.0	85.0	90	105	106	104	92	92	95	98	**117.6**		
								120												
																	120			

Position nb.	Description	2017 Jan	2017 Feb	2017 March	2017 April	2017 May	2017 June	2017 July	2017 Aug	2017 Sep	2017 Oct	2017 Nov	2017 Dec	2018 Jan	2018 Feb	2018 March	2018 April	2018 May	2018 June	2018 July
3252	Sandals women	Imputation						89.0	85.0	90	105	106	104	92	92	95	98	**109**		
								120												
																	120			

+ 20% or -10% ? Probably inbetween



Thank you!

“I know that I have some very big shoes to fill”