

In [2]:

```
from IPython.display import Image
```

Barrier experiments

The research question: **Does the composition of the population becomes affected if the dispersal wave comes accross a barrier?** A barrier is defined as an area inhospitable for hominins because they are not adapted to it.

So far we tried to:

- Compare the population before and after the barrier immediately after it is crossed.

There is no significant difference

- Compare the population before and after the barrier throughout the run. The run stops when the end of the world (10 cells further on) is reached.

There is no significant difference

- See if there is a difference in the versatelist's time to fixation on the final cell of the world between runs with and without a barrier.

There is no significant difference

- Compare the population before and after the barrier throughout the run. The run stops when the versatelist fixates in the last cell.

There is no significant difference

- Compare the population on the first cell (this cell is never 'dispersed into) and after the barrier throughout the run. The run stops when the agents reach the last cell.

There is no significant difference

- Compare the population on the first cell and after the barrier for a larger barrier (3 instead of 1 cell). The run stops when the agents reach the last cell.

There is no significant difference

- Compare the population on the first cell and after the barrier for a larger world (100 cells) and larger barrier (10 instead of 1 cell). The run stops when the agents reach the last cell.

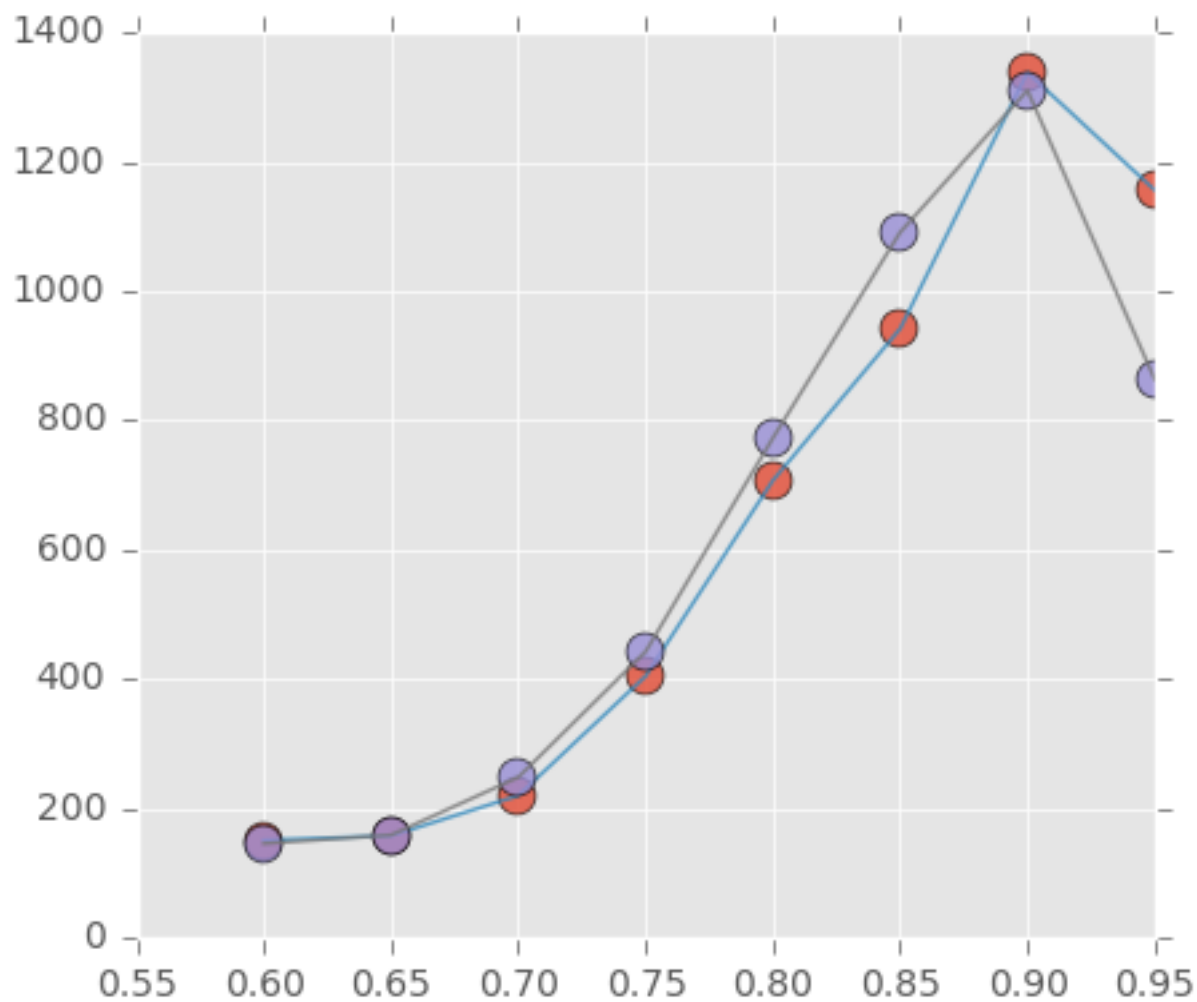
There is no significant difference

**Difference in the versatelist's time to fixation on the final cell of the world.
Plotted: runs with a barrier and runs without barrier**

In [2]:

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Image(filename='/Users/iarlg09/Dropbox/IZA/PHD/case_studies/variability_case_study/last_cell_time_to_fixation.png')
```

Out[2]:



Population before and after the barrier throughout the run. The run stops when the versatelist fixates in the last cell.

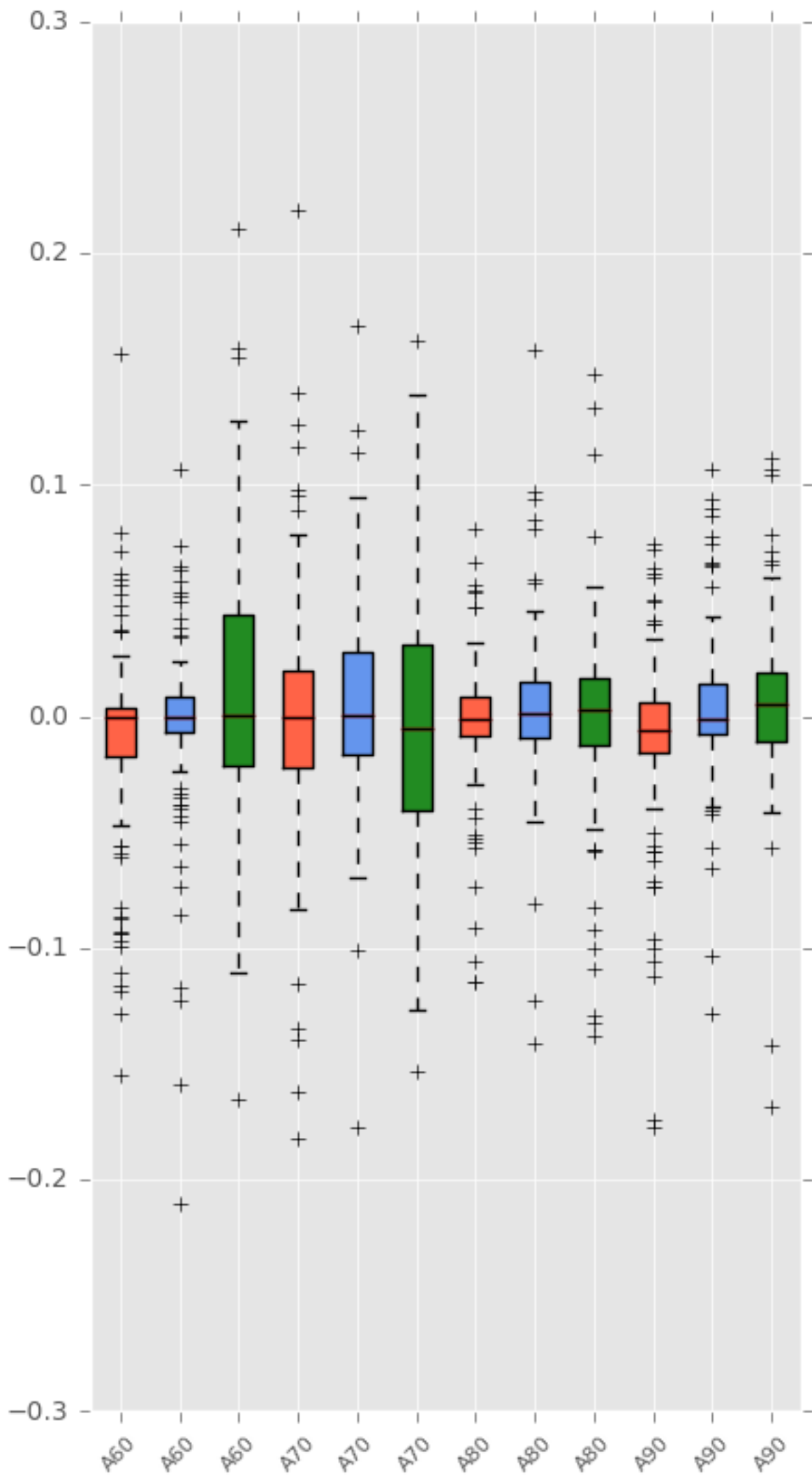
100 seeds run. We display the distribution of frequencies of each gene pre-barrier minus post-barrier. So values around 0 mean no change.

First, with no barrier.

In [6]:

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Image(filename='/Users/iarlg09/Dropbox/IZA/PHD/case_studies/variability_case_study/around_barrier_allNoBarboxplot.png')
```

Out[6]:

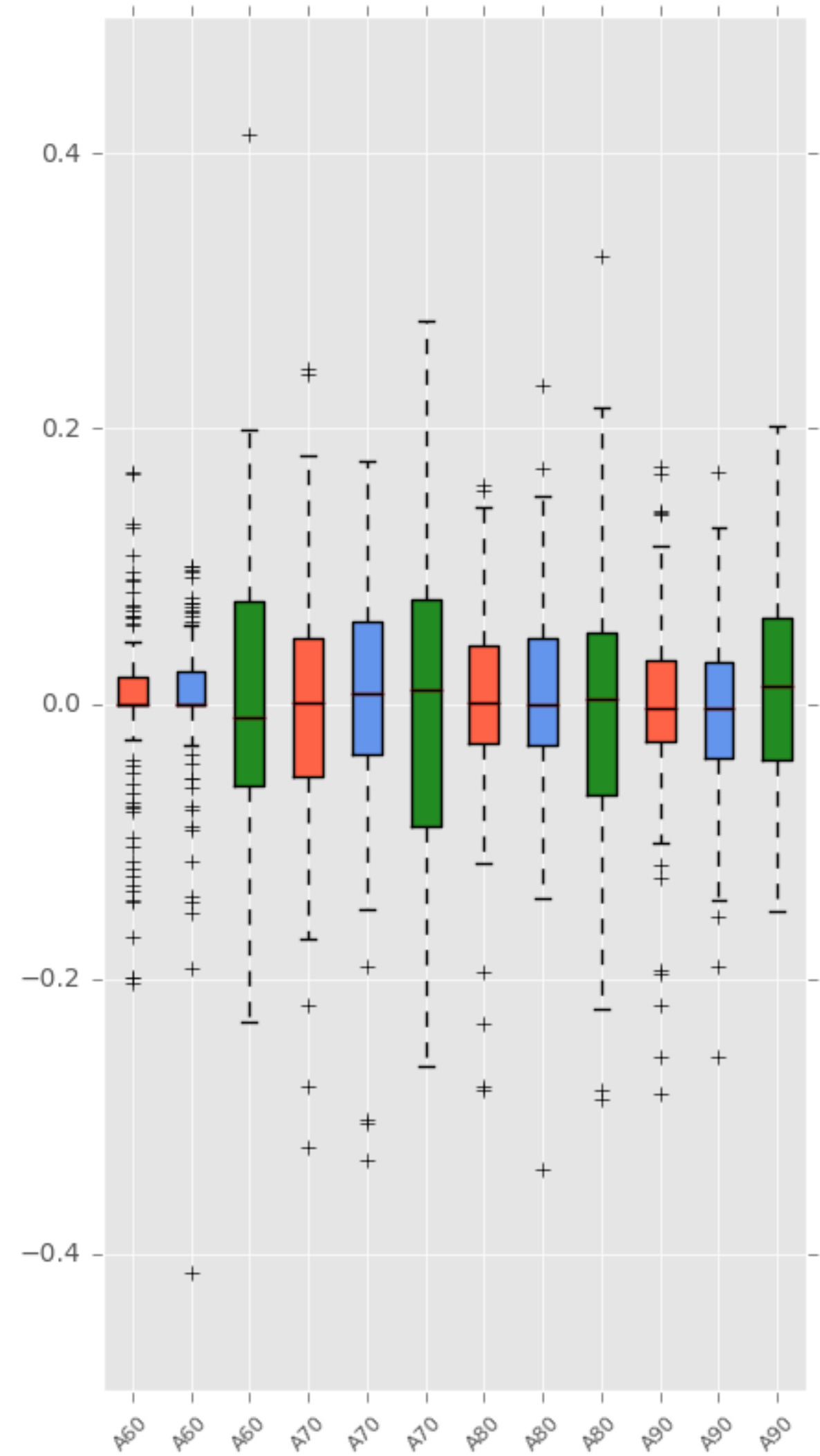


Then with a barrier.

In [7]:

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Image(filename='/Users/iarl1g09/Dropbox/IZA/PHD/case_studies/variability_case_s  
tudy/around_barrier_allBarboxplot.png')
```

Out[7]:

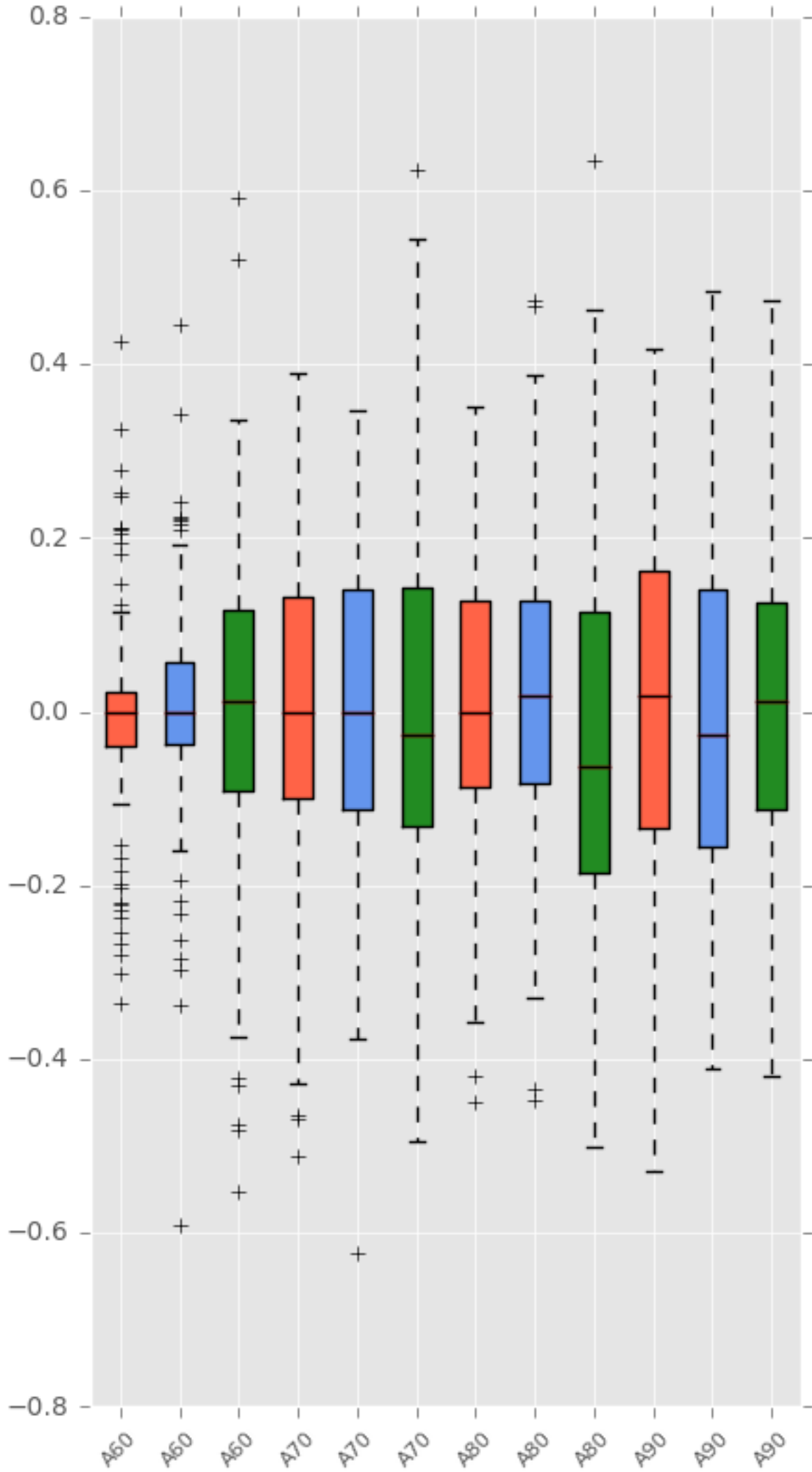


Population on the first cell and after the barrier throughout the run. The run stops when the agents reach the last cell.

In [4]:

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Image(filename='/Users/iarlg09/Dropbox/IZA/PHD/case_studies/variability_case_study/1stAndPostBarBar_short_boxplot.png')
```

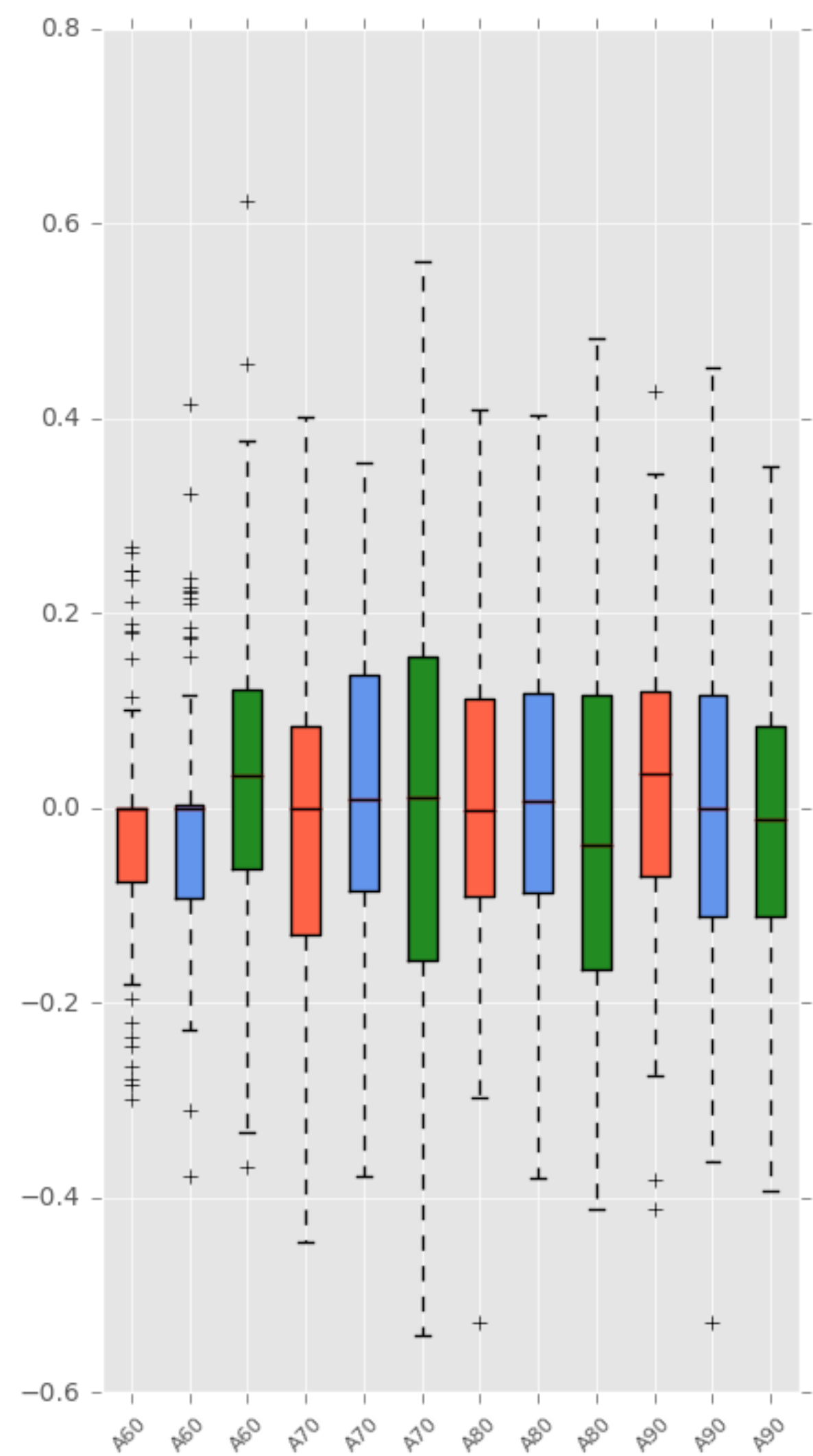
Out[4]:



In [5]:

```
Image(filename='/Users/iarlg09/Dropbox/IZA/PHD/case_studies/variability_case_s  
tudy/1stAndPostBarNoBar_short_boxplot.png')
```

Out[5]:

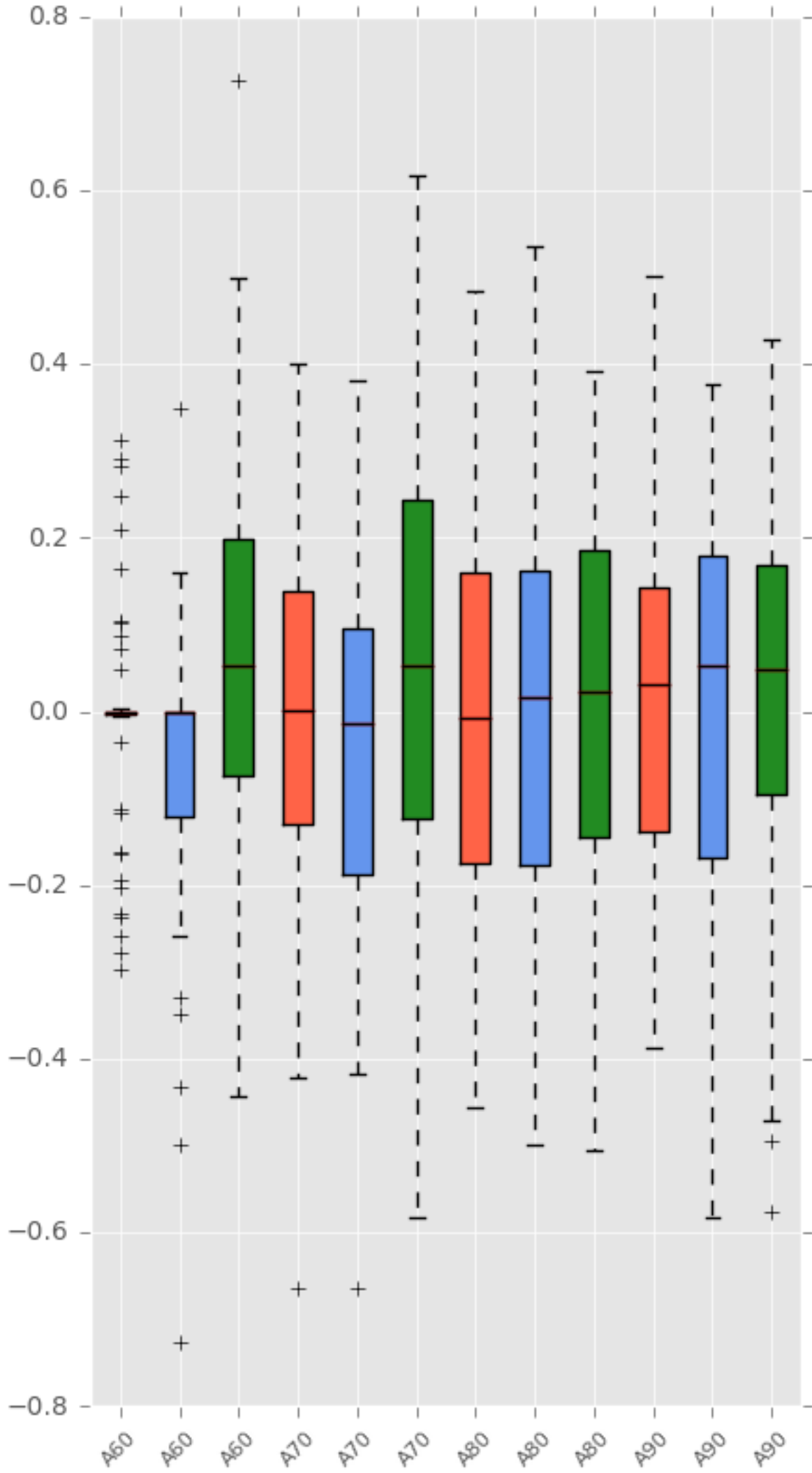


Larger barrier - 3 cells instead of 1.

In [4]:

```
Image(filename='/Users/iarlg09/Dropbox/IZA/PHD/case_studies/variability_case_study/1stAndPostBar_bigBar_Bar_boxplot.png')
```

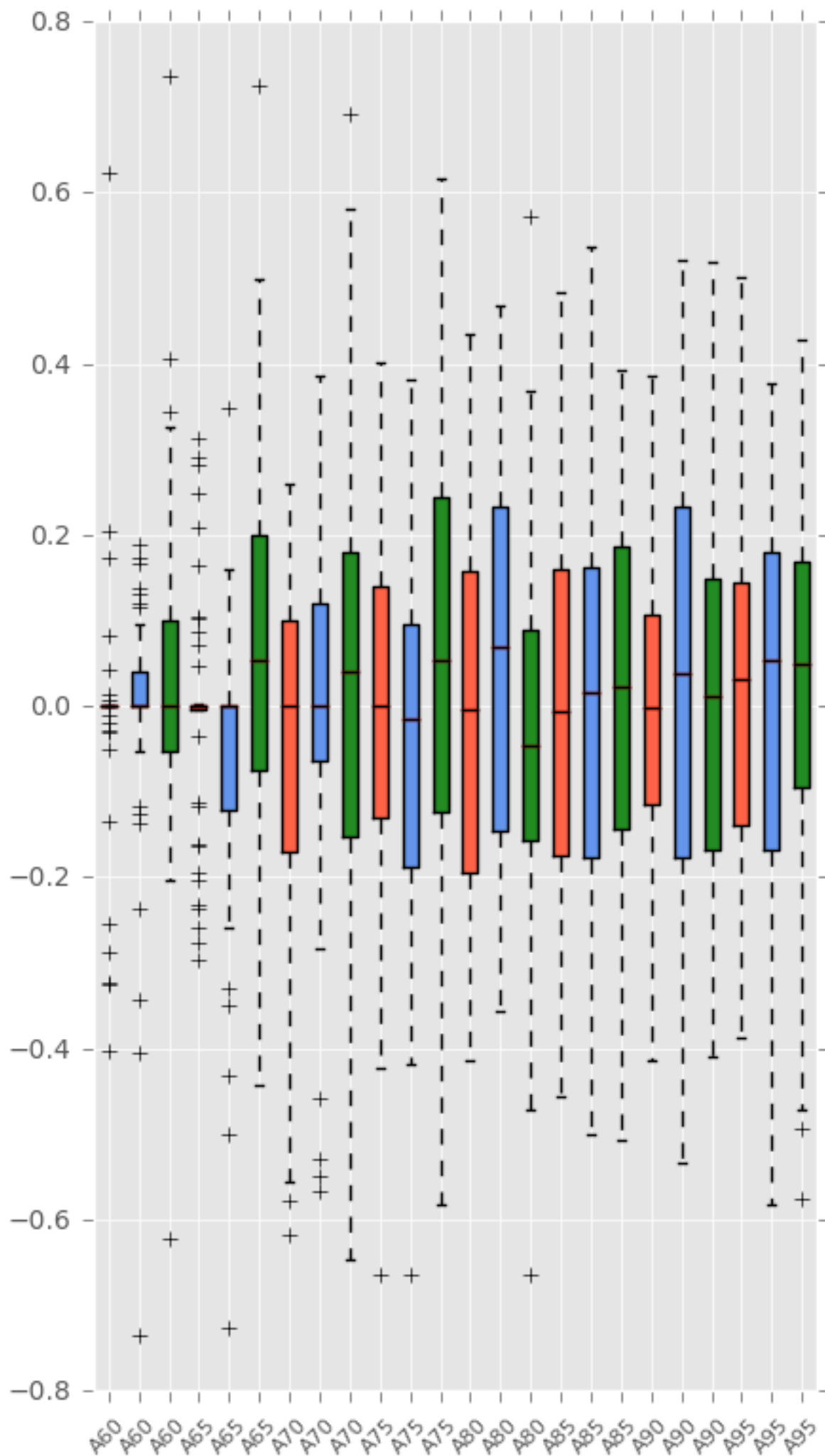

Out[4]:



In [6]:

```
Image(filename='/Users/iarlg09/Dropbox/IZA/PHD/case_studies/variability_case_study/1stAndBar_bigBar_allBar_boxplot.png')
```

Out[6]:

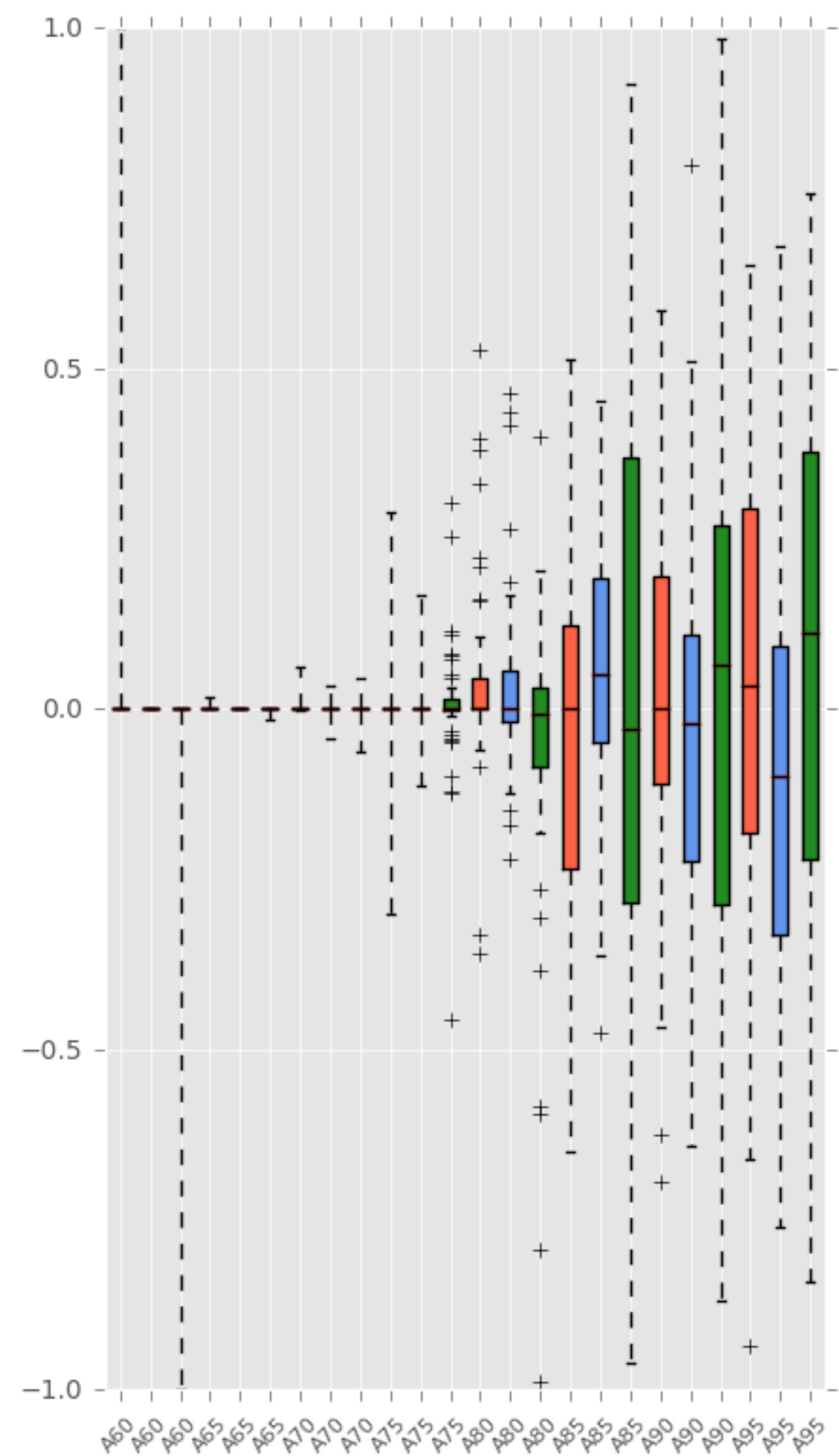


This is the only one that seem to have a tiny bit of a pattern. Most of the medians are over the zero line but nothing to be writing home about. So I extended the world hoping for a stronger effect.

Larger world - 100 cells incl. 10 barrier cells at the beginning.

```
In [10]:  
  
Image(filename='/Users/iarlg09/Dropbox/IZA/PHD/case_studies/variability_case_s  
tudy/1stAndPost_bigChain_allBar_boxplot.png')
```

Out[10]:



For the piece of mind I checked if the migration on its own does anything. This is population on the 1st cell compared to the population on a cell BEFORE the barrier.

In [12]:

```
Image(filename='/Users/iarl1g09/Dropbox/IZA/PHD/case_studies/variability_case_study/1stAndPreBar_bigBar_allBar_boxplot.png')
```

Out[12]:

