Does armed conflict influence population size?

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Agenda

Research Question & Significance

How does armed conflict influence population size?

- More people or fewer people?
  - Short term
  - Long term

Why is this important?

- Armed conflict common globally
- Policy making
- Population projection
- Shocks that are pervasive beyond armed conflict

Don't we know this? People die!

Armed conflict:

- People die
- People get sick/injured

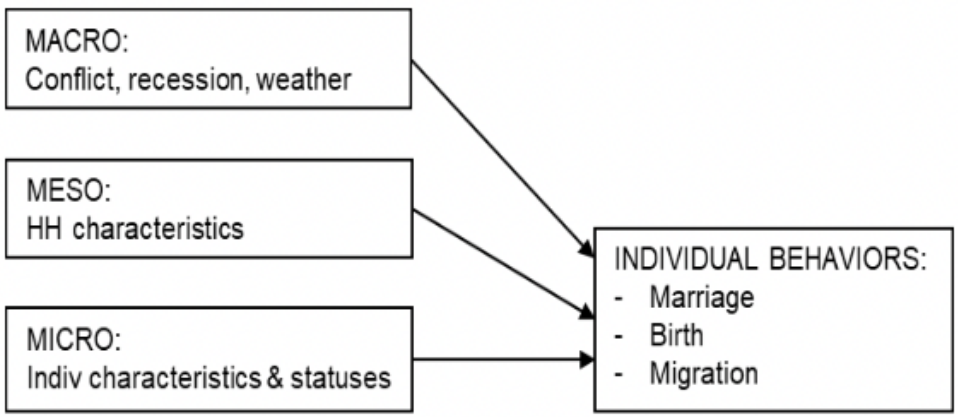
} Fewer people

Armed conflict X other demographic behaviours:

- Marriage rates
- Age at marriage
- Fertility rates
- Age at births
- Education
- Employment
- Etc.

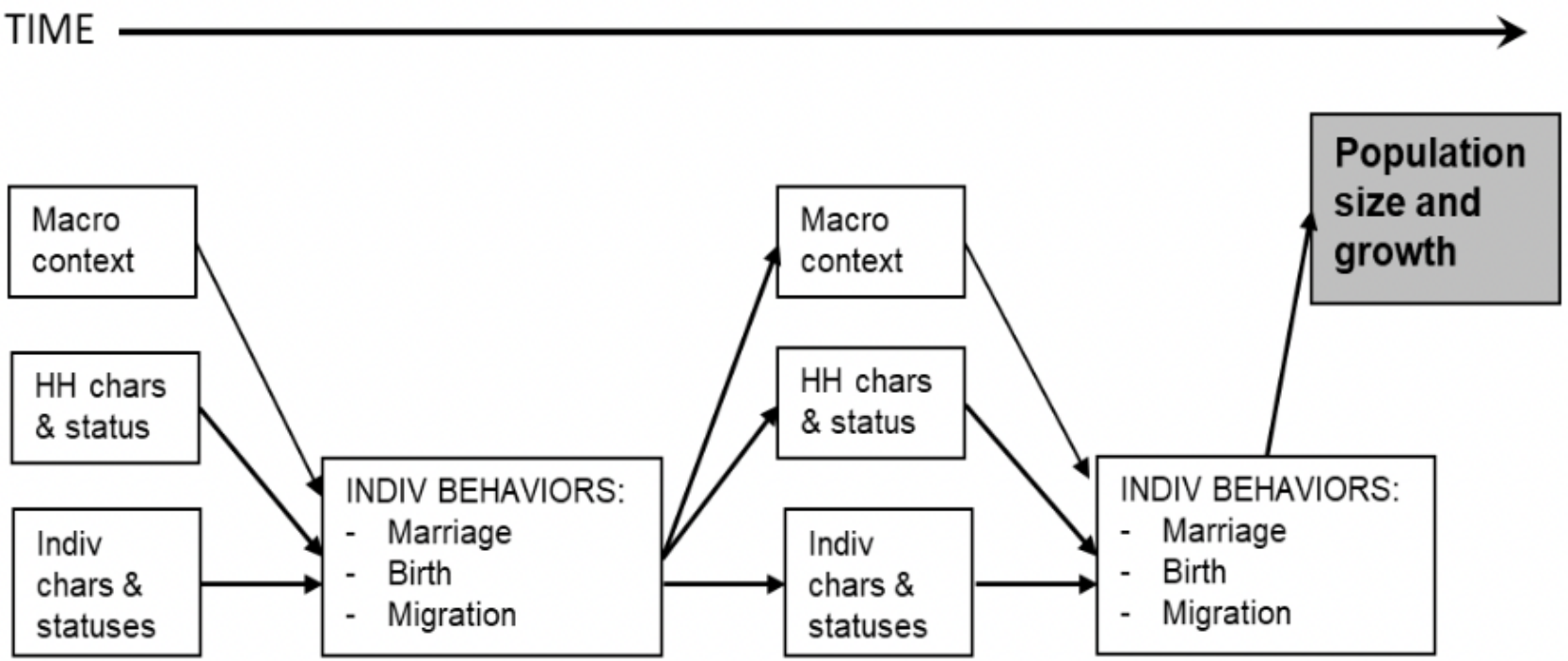
} Fewer people? We have no idea!

Conceptual Framework



Probability of Marriage – Women
Log (P/(1-P)) = (-4.9742)
+ (gun_battles * 0.3624)
+ (bomb_blasts * (-0.0664))
+ (emergency * 0.2403)
+ (instability * 0.4063)
+ (age * 0.0053)
+ (education * 0.0385)
+ (high_caste * 0)
+ (distance * 0.0437)

Conceptual Framework



Agent-based Models

Computational simulation of hypothetical population

- Agents

Agent-based Models

Computational simulation of hypothetical population

- Agents
- Behavioural rules

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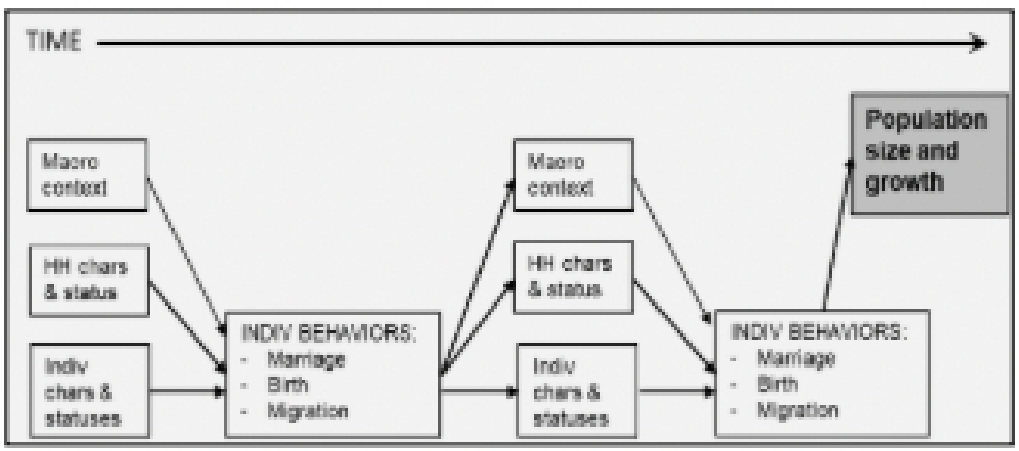
Probability of Getting pregnant
Eligibility: Woman, married, living with spouse, not already pregnant, < 45 years old.
Log (P/(1-P)) = (-2.1332)
+ (gun_battles * (-0.1227))
+ (bomb_blasts * (0.0114))
+ (strikes_protests * (-0.2367))
+ (education * (0.0256))
+ (age * (-0.0309))

Agent-based Models

Computational simulation of hypothetical population

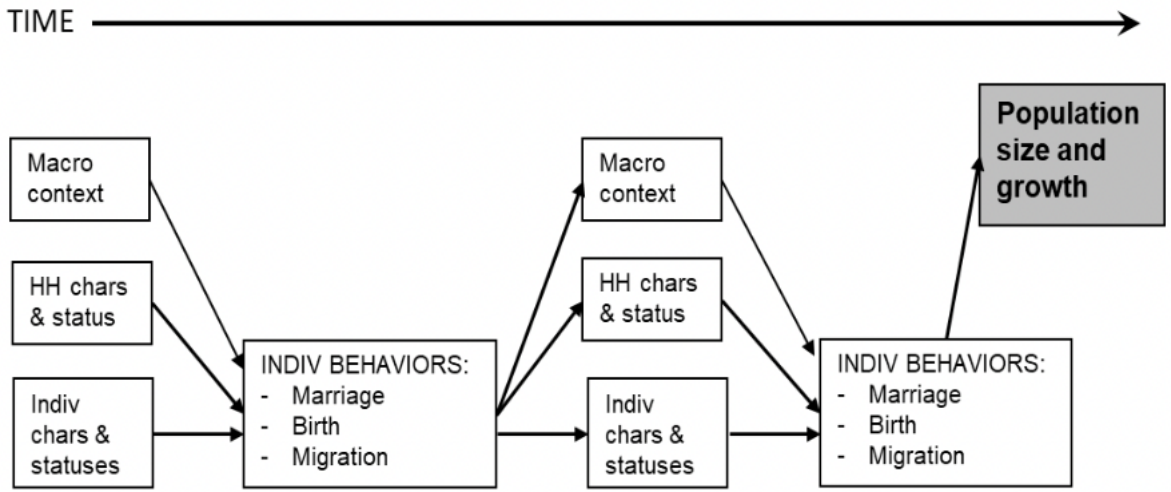
- Agents
- Behavioural rules
- Simulate war

Month	# bombs	# guns
1	4	0
2	9	0
3	3	2
4	2	1
5	5	3
6	12	0



Agent-based Models

What do you get out of this?



- Complex, non-linear population dynamics
- Interactions with time-varying context (war)
- Micro-level behaviours to macro-level outcomes

Agent-based Models

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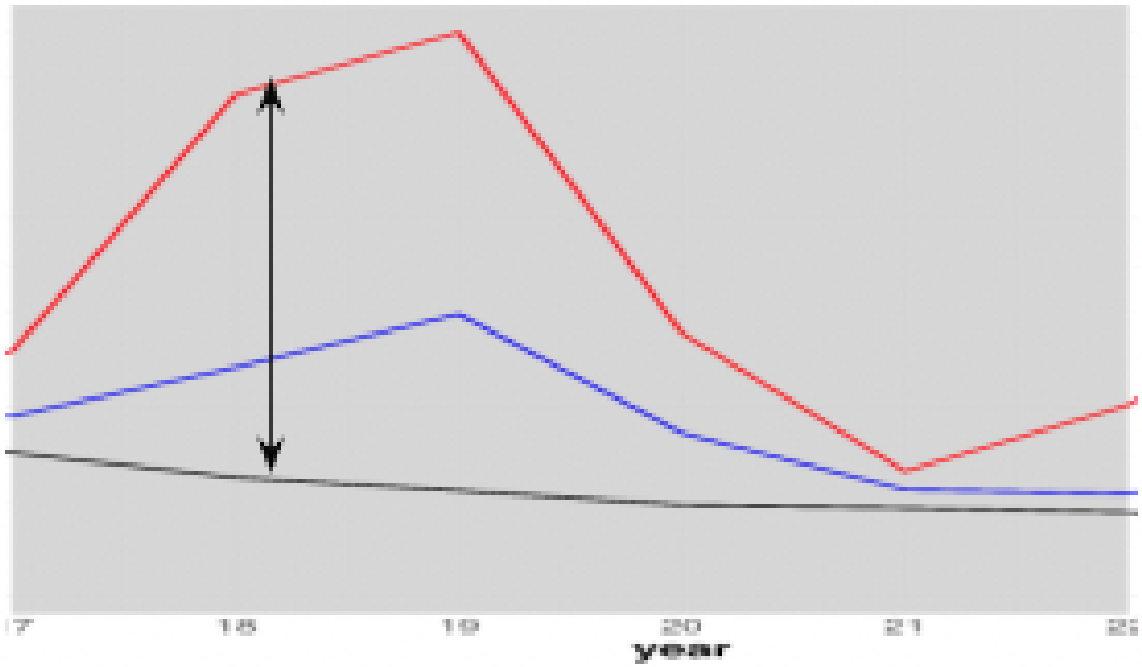

- Experimental laboratory
  - Number of people in war scenario?
  - Number people in non-war scenario?

Our ABM

Chitwan Valley

- Rural agricultural area
- 5 year armed conflict
- ABM population matches real population – survey data (CVFS)
- Behavioural rules: Regression equations from survey data (CVFS)
- Armed conflict events: INSEC, SATP, local sources, news

Population Size

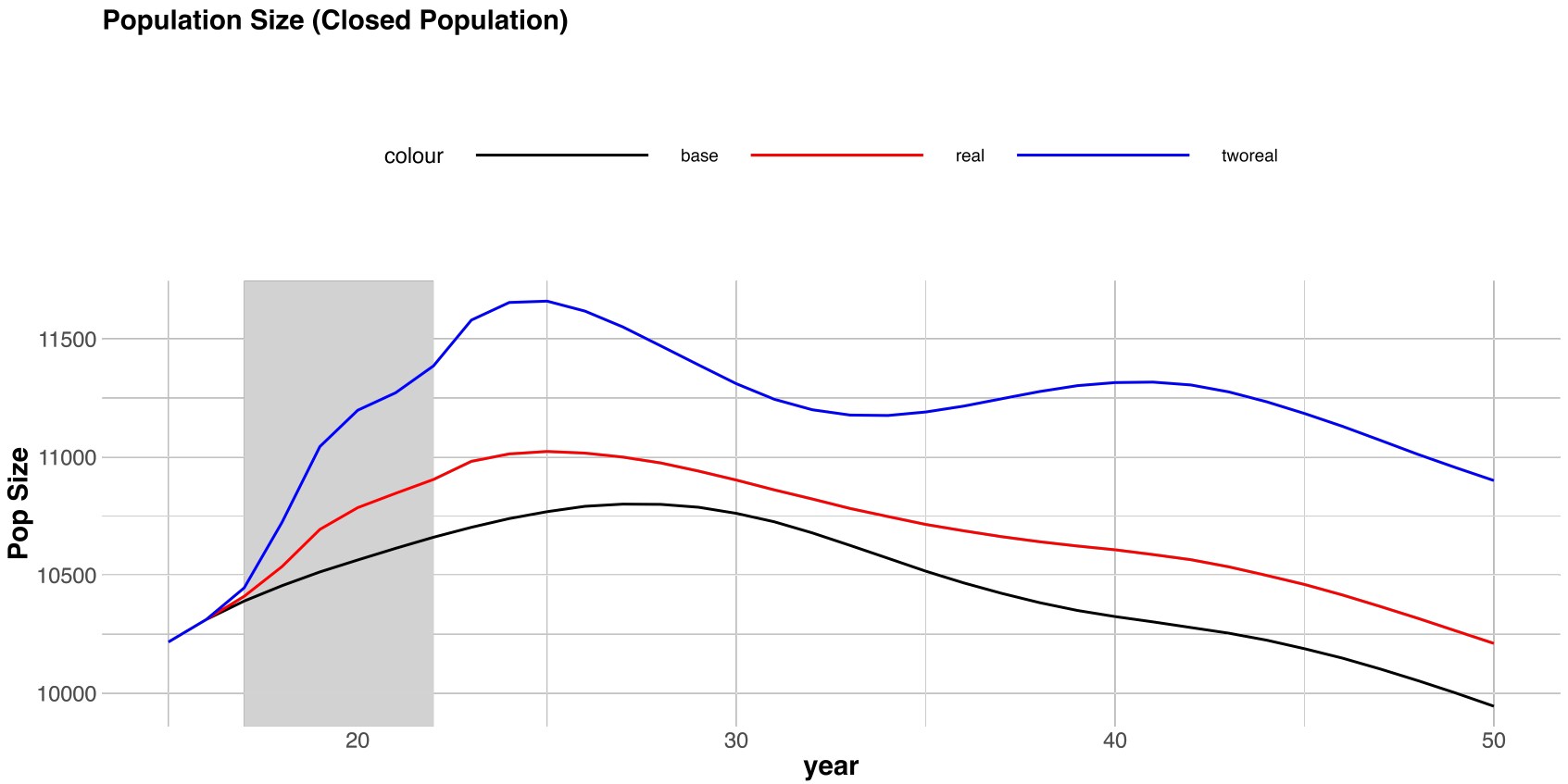

Figure 1: Population size (Conflict period)

- LARGER population during and after conflict period

Population Growth

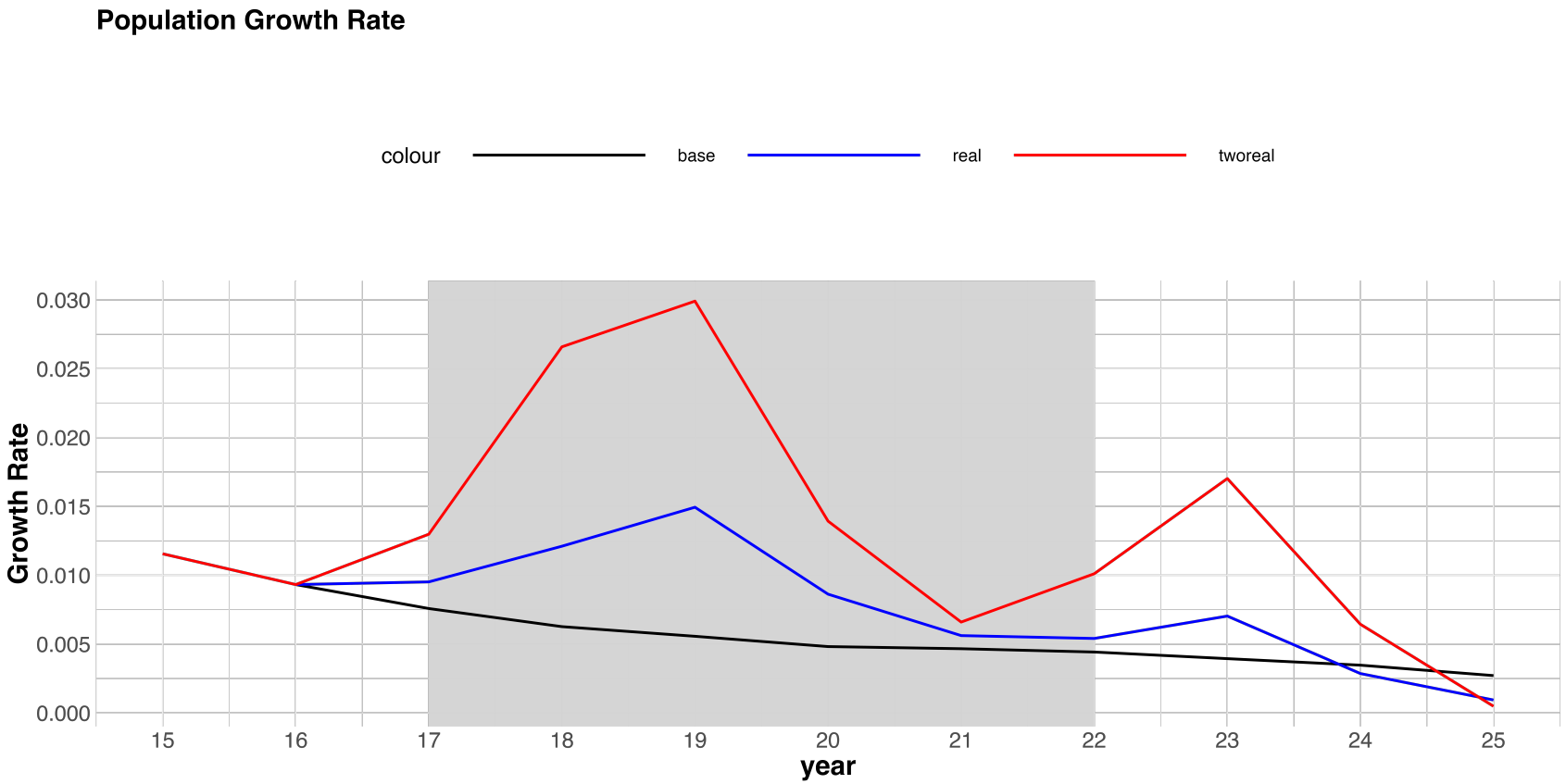

Figure 2: Population growth (Conflict period)

- Shorter-term spikes in population growth

Population Growth

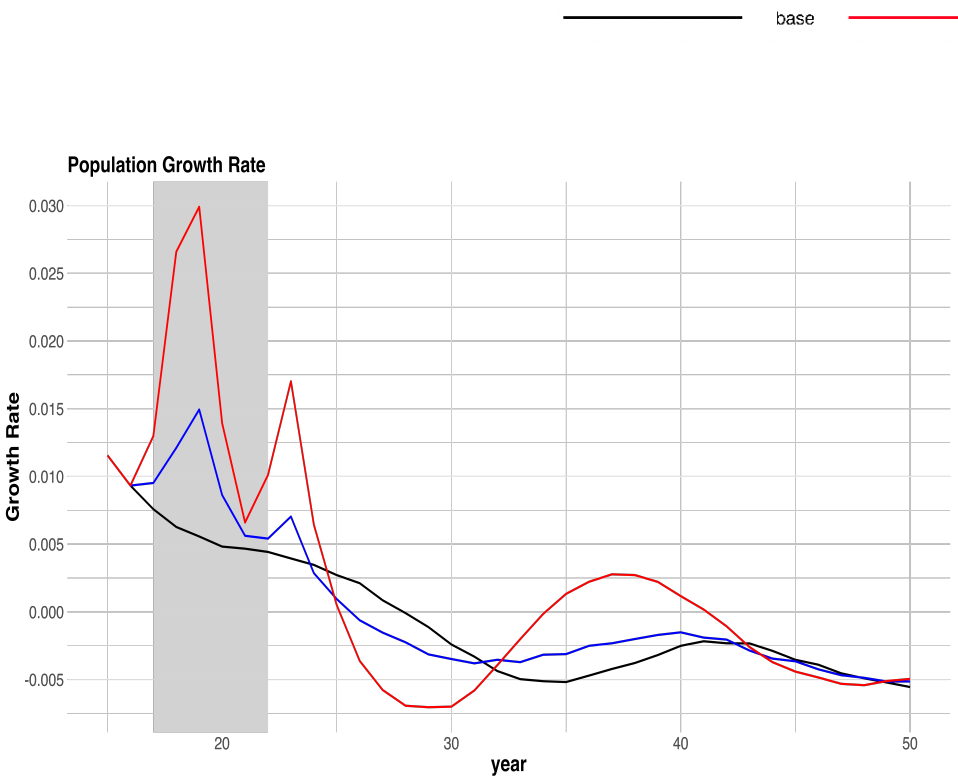

Figure 3: Population growth

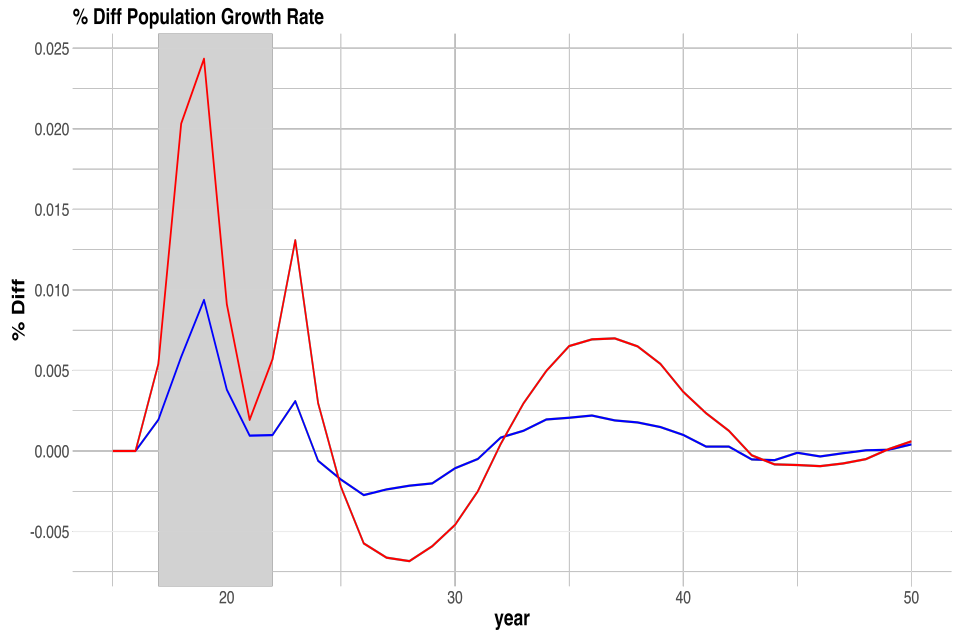

Figure 4: % Diff Population growth

- Why? Differences in birth and death rates?

Birth Rate

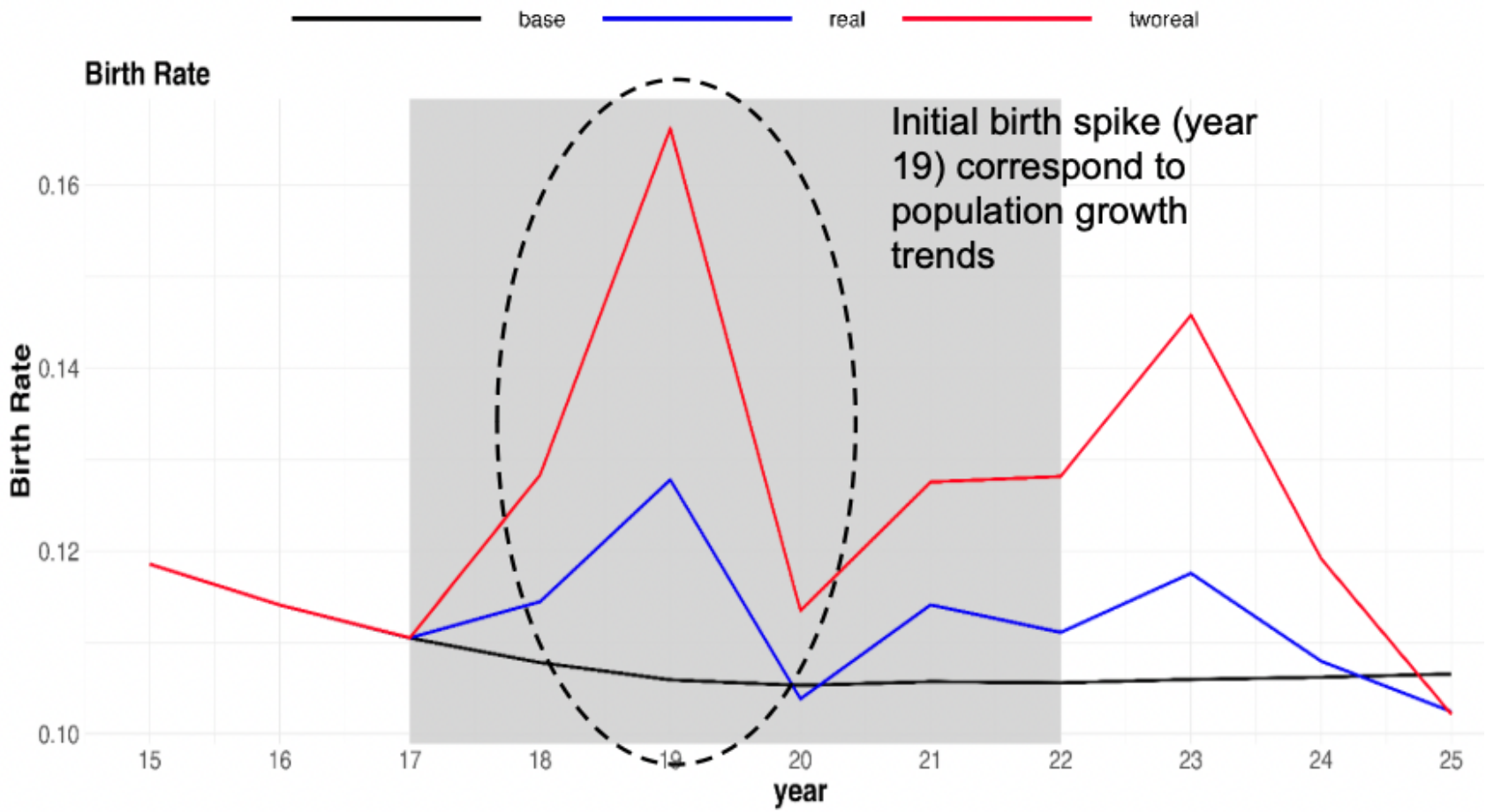

Figure 5: Birth rate (Conflict period)

- Shoter-term spikes in birth rates

Birth Rates

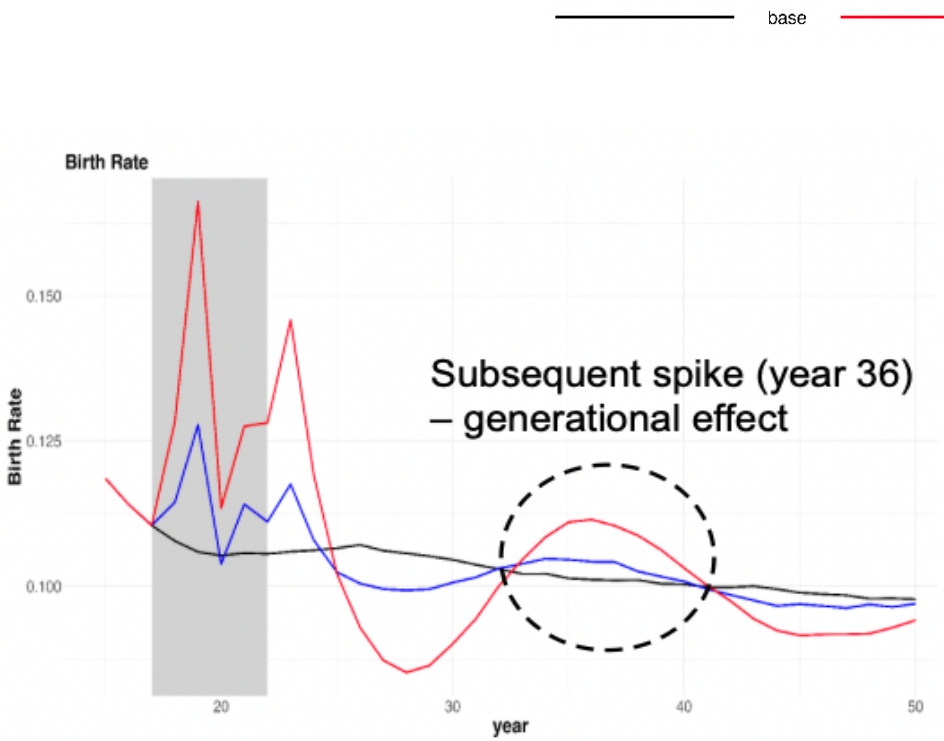

Figure 6: Birth Rates

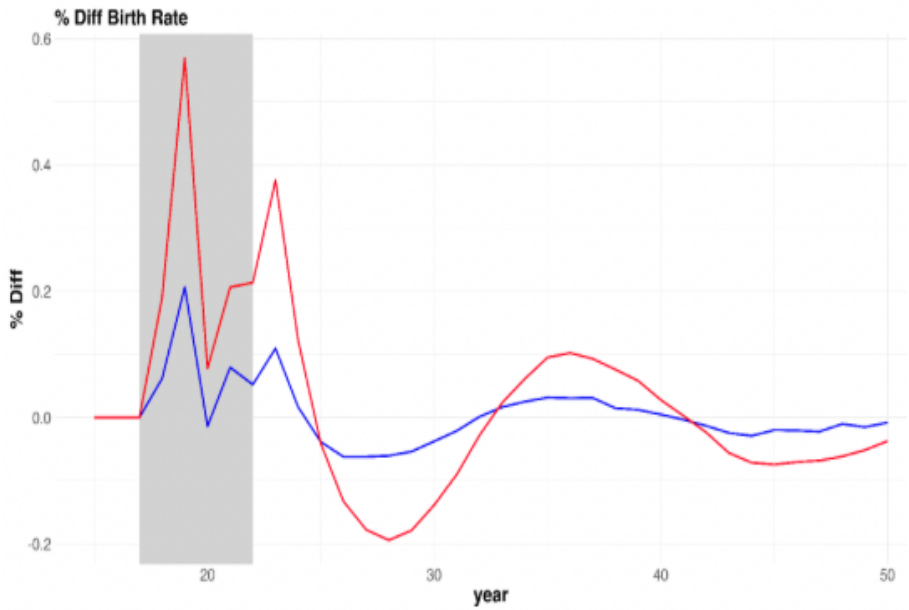

Figure 7: % Diff Birth Rates

Short-term spikes in birth rates. Why?

1. Eligibility of birth (marriage)
2. Behavioural equations (conflict events)

Marriage Rates

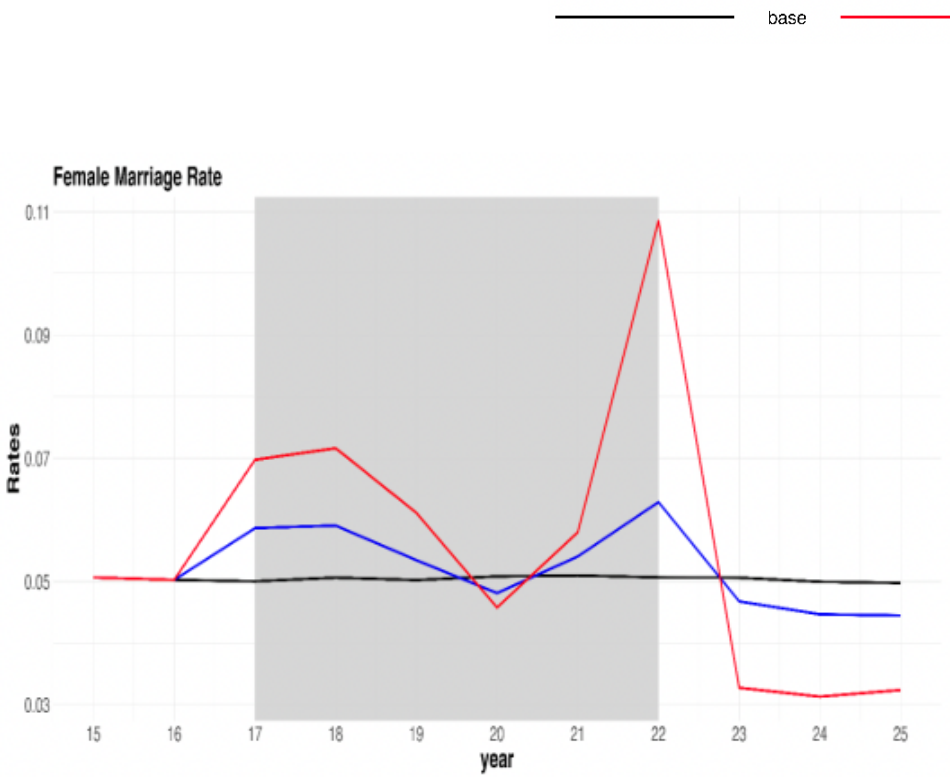

Figure 8: Female marriage rates (Conflict period)

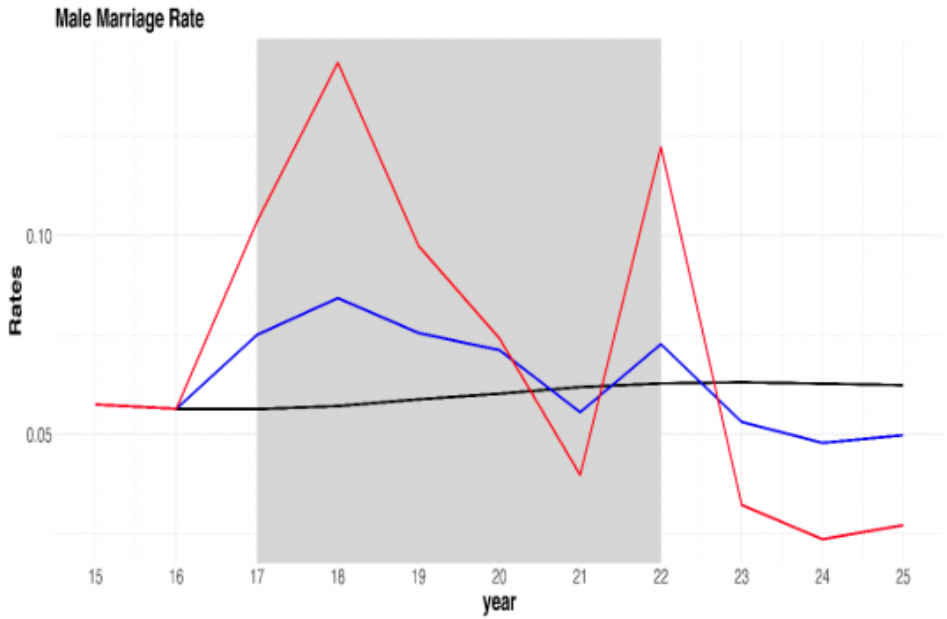

Figure 9: Male marriage rates (Conflict period)

- Short-term spikes in marriage rates

Marriage Rates

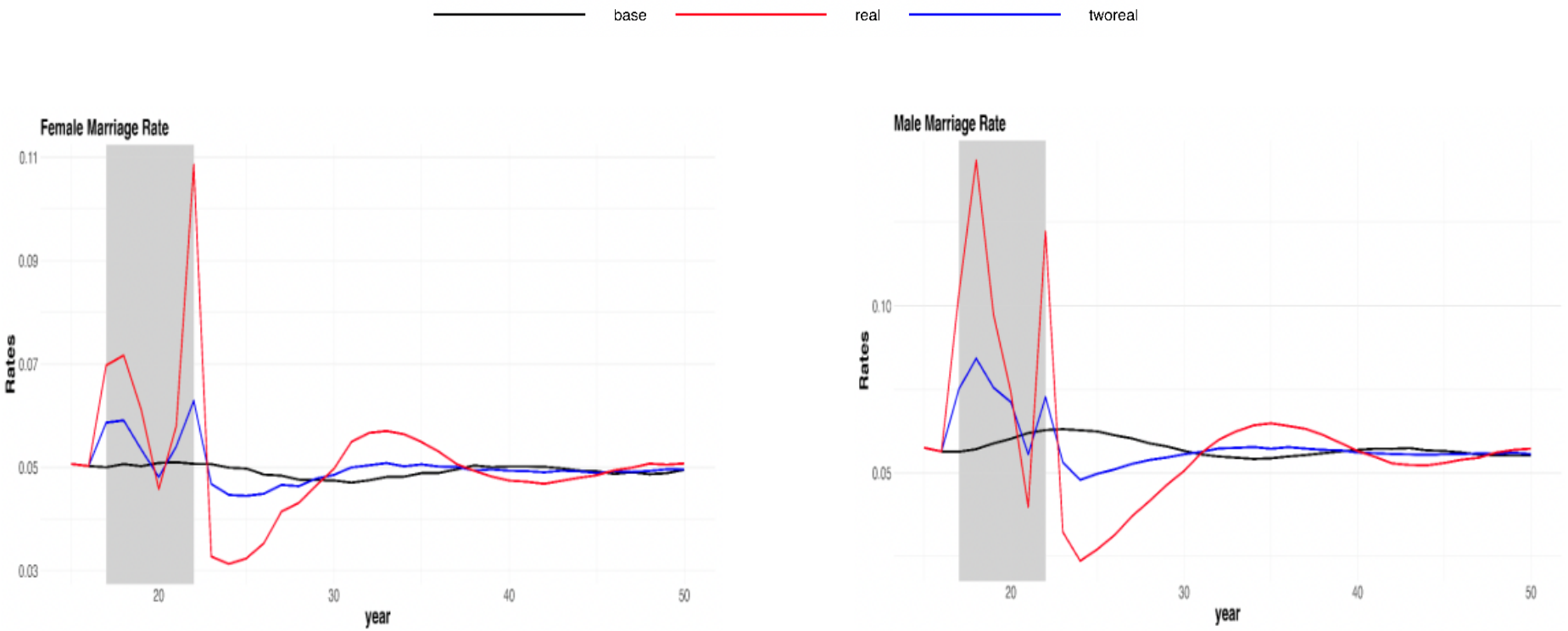

Figure 10: Female marriage rates

Figure 11: Male marriage rates

- Gender asymmetry in marriage proportions – difference in behavioural equations?
- Effect on marriage weakens in the long term

Marriage and Birth Rates

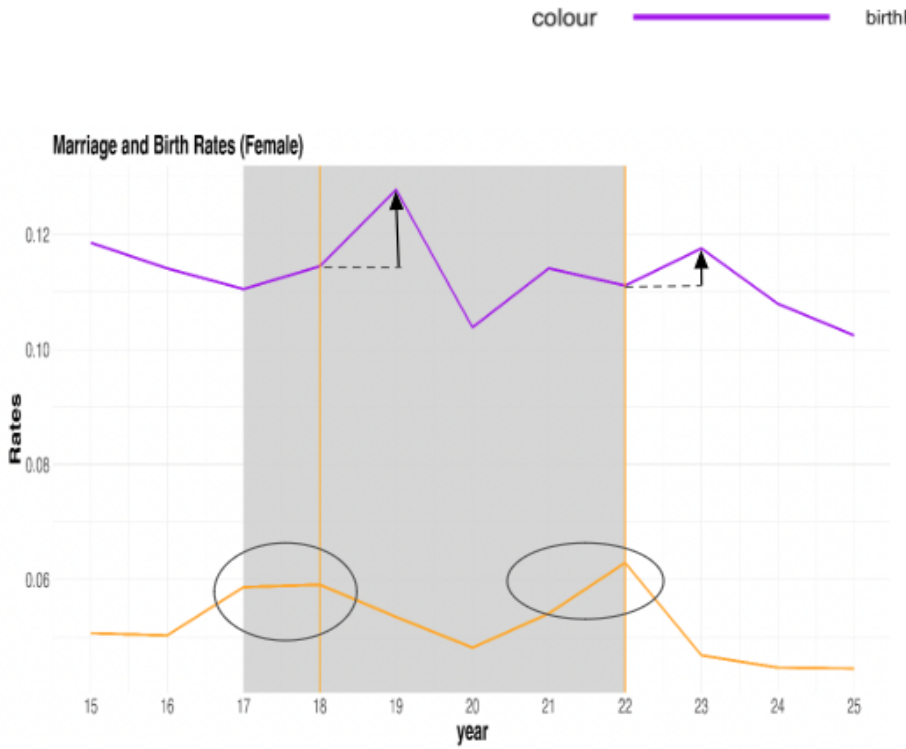

Figure 12: Female marriage + birth rates

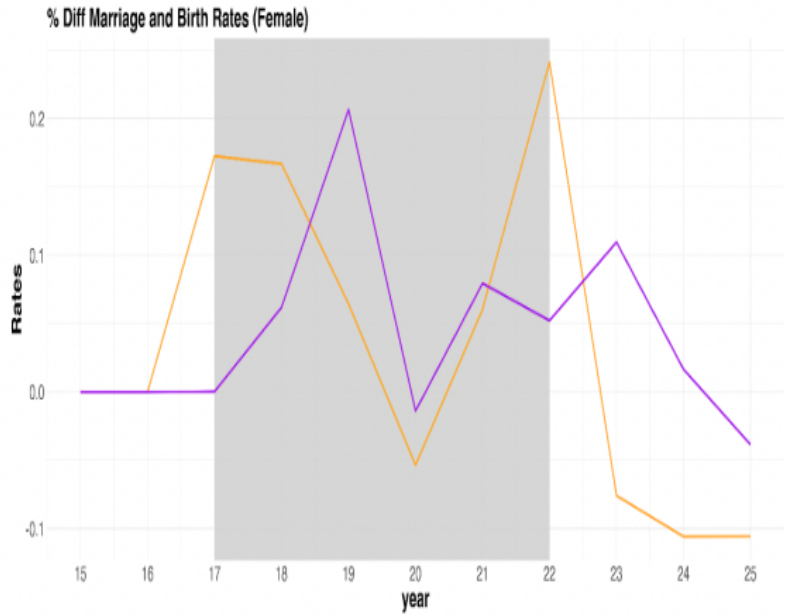

Figure 13: % Diff Female marriage + birth rates

- Peak in marriage rates precede peaks in birth rates & population growth by 1 year
- Conflict events that affect birth rates too

Marriage and Birth Rates

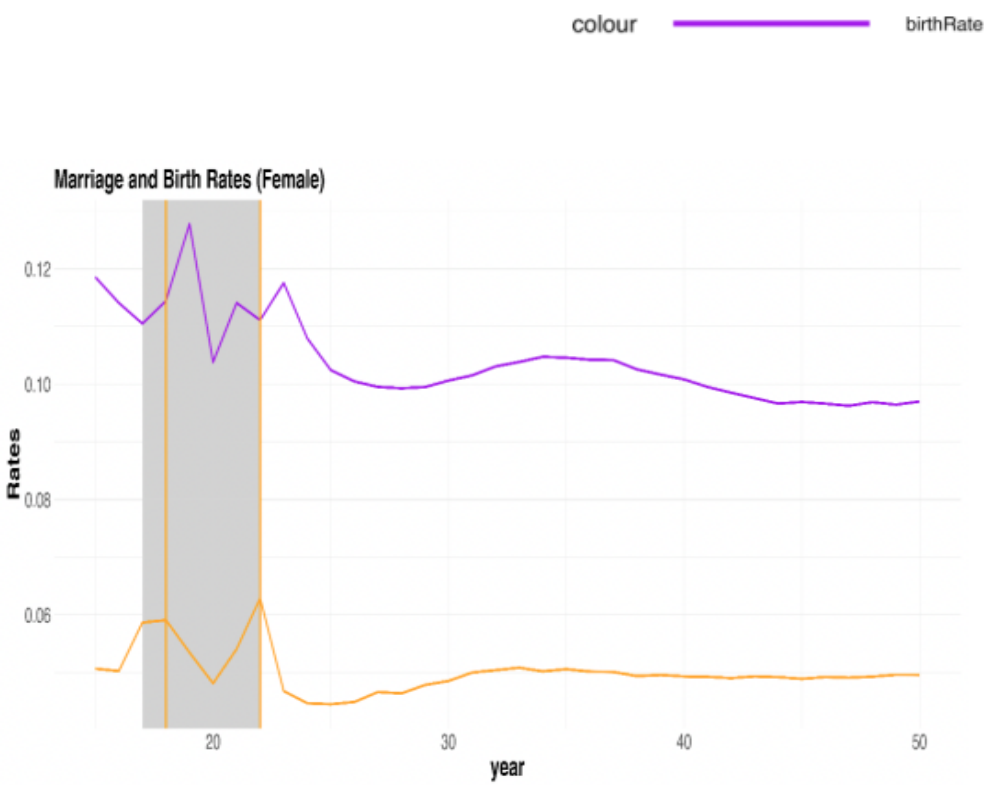

Figure 14: Female marriage + birth rates

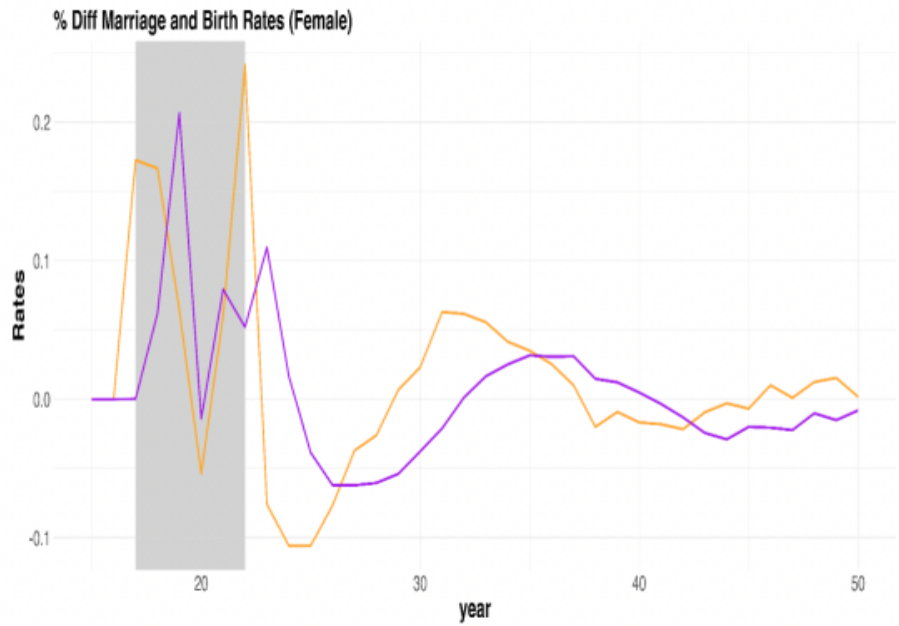

Figure 15: % Diff Female marriage + birth rates

- Trends in marriage rates precede birth rates

Conclusion

Conflict increases population size

- Short-term increases in marriage and birth
  - Long-term increase in population size
- Long-term stability in population trajectories; but overall higher population size

Moving forward

- Population age structure. Younger population?
- Number of children ever born. Higher?
- Age at first marriage. Younger?
- Age at first birth
- Tempo of births

Questions

- Birth Rate
  - How do we distinguish between birth rate patterns due to marriage from other independent birth effects?