

1 Buildings and population

The main effect of buildings is to give a bonus to population. This happens in one of two ways. The base weight of a province is given by $M + P$, manpower plus production, both integrated over time, where

$$\begin{aligned}M &= 0.125 * m * b \\P &= b * p \\b &= 0.05 * t + \min(2.0, 0.99 * (c/101000))\end{aligned}$$

where p is the price of the trade good in the province, m is the ‘manpower’ number listed in the save, t is the basetax, and c is the city size. Buildings that affect manpower or production thus give additional weight just by giving bonuses to these numbers. Buildings that don’t, instead give a percentage bonus proportional to $\sqrt{0.001 * cost}$. This quantity is multiplied by the time the building has existed, divided by the time it *could* have existed; so a building invented in 1399 and built in 1599 gives half its maximum bonus to a conversion in 1799.

The integration over time also strives to take historical slider positions, decisions, and triggered modifiers into account, but does not do so perfectly. Slider changes, for example, are not stored in the save, only the initial and final positions, so I use a heuristic that most of the changes occur early in the history, and interpolate. This also means that if you start, say, at 0, are at 5 for much of your history, and end at 3, the converter will think you were between 0 and 3 for the whole game. Can’t be helped!

There are some other minor modifiers to population:

- Capitalists only go where there is a stock exchange.
- Craftsmen and clerks only go where there are factories, and vice-versa.
- Nations with the abolish slavery decision get no slaves.
- Some trade goods attract or repel some pop types, as shown in config.txt. For example, tobacco, slaves, sugar and cotton all attract slaves.
- Slider positions and national ideas have a small effect in attracting some pop types; again this is shown in config.txt. For example, Free Subjects is attractive to labourers and farmers, while Plutocracy attracts capitalists.

- Occupations and low religious tolerance reduce population weight, integrated over time. A province which was occupied by someone other than its owner for the whole of EU3 would only get 10% of the population it would otherwise have. A province which was consistently at -3 tolerance would get 50% of its population.

Additionally, some buildings affect literacy. In particular, each building has a literacy weight (which defaults to zero) in `buildings.txt`. The literacy weight of a province is calculated thus: For each province in the world, add up the literacy weight of its buildings and divide by the distance (plus 1) between the two provinces. Integrate this quantity over time. Then redistribute the vanilla literacy according to this literacy weight.

2 Sliders

Sliders affect population as outlined in the previous section; trade power, which affects technology as discussed below; literacy, and politics. Each pop type has a 'literacy' section in `config.txt`, showing the effect of sliders. Notice that these are percentage bonuses to the literacy weight, not direct modifiers to the literacy; note also that they are not integrated over time.

Sliders also affect the customisation of parties. Each party type in the `ideologies` field of `config.txt` has an entry for each attitude, and each such entry (for example, for jingoism) has a sliders section. The numbers are to be read as percentage modifiers to the base weight that the party in question will have that attitude. Thus, for example, consider the entry for conservatives:

```
conservative = {
  start_date = 1830.1.1
  jingoism = {
    ideas = {
      national_conscripts = 1.25
      battlefield_commissions = 1.25
      military_drill = 1.25
      deus_vult = 1.1
    }
  }
  sliders = {
    land_naval = -0.03
  }
}
```

```

    }
  }
}

```

There is some base weight for conservatives to be jingoist, which is equal to the fraction of vanilla conservative parties that are jingoist. It is modified by slider positions; in this case, each click towards naval decreases the base weight by 3%. The *probability* that they are jingoist is equal to this modified weight, divided by the sum of the modified weights for jingoism, pacifism, anti-military, and pro-military.

In addition to the effect on parties, sliders can affect reforms. Government forms which require some voting to exist get the landed voting reform; others get nothing. For the other political reform types (social reforms are all at the lowest possible upon conversion), nations earn points as shown in config.txt. For example, consider the slavery entry:

```

slavery={
  base=no_slavery
  provinces={
    cotton = 2
    slaves = 2
    tobacco = 1.5
    sugar = 2
  }
  modifier = {
    mod = the_abolish_slavery_act
    mult = 0
  }
  slider = {
    which = serfdom_freesubjects
    value = -0.03
    max = 0
  }
  threshold = {
    value = 0.15
    rhs = yes_slavery
  }
}

```

This says that the base position is “No Slavery”. The ‘threshold’ entry says that if the nation has more than 0.15 points, the value instead becomes “Slavery Allowed”; for other reforms there can be more than one threshold. The slider entry indicates that each click towards serfdom gives 0.03 points, but clicks towards freedom do not give additional points (“max = 0”). The provinces entry says that provinces having the goods indicated give an amount of points equal to their percentage of the weighted sum of total national basetax, where the weights are equal to the numbers given, or 1. (That is to say, consider a nation with two provinces, one with slaves and basetax 2, the other with gold and basetax 3. The total weight is $(2 * 2 + 1 * 3) = 7$, and the slave province will therefore give $4/7 \approx 0.57$ points towards the slavery reform. Finally, the ‘mod’ field indicates that if the nation has the national modifier in question, the points value is multiplied by ‘mult’ - in other words, nations which have abolished slavery do not get the “Slavery Allowed” political reform, however far they are towards serfdom or however many cotton, slave, tobacco and sugar provinces they have.

Sliders also affect national values as shown in natvalues.txt. The numbers here are to be read as weights which each click along the slider gives to the value in question; the highest weight wins.

3 National ideas

These affect literacy, political parties, reforms, and national values basically in the same way as sliders.

4 Technology

Affects starting research points and civilised status. Nations which have at least four of the five tech areas within one level of up-to-date will convert civilised. Additionally, each tech area gives $30000 * (N/80)^2$ research points where N is the EU3 tech level. Finally, the most advanced tech level decides which research institution the nation gets.

In addition, trade power, which is calculated as a nation’s share of the total trade income of the world (approximately - the calculation doesn’t catch every possible modifier to trade income), with a time-integrated bonus from customs houses, is applied as a percentage bonus to RPs.

5 Customisation

Parties and national stockpiles may be customised. Additionally, for AHD, the initial techs are customisable.

Initially parties are generated randomly as outlined in the section on sliders. However, they may then be customised. Each country gets a number of customisation points, calculated as follows. Government buildings have a 'moddingPoints' entry; the total modding points of a nation, divided by its provinces, is its modding fraction; customisation points are distributed in proportion to the modding fractions. Example: England has 1 temple giving a single modding point, and two provinces; its modding fraction is 0.5. Germany has two temples and three provinces, giving a modding fraction of 0.66. England will get $0.5/(0.5 + 0.66) = 43\%$ of the total customisation points.

The customisation points are calculated thus: Every time a political party is randomly generated, there was some probability that it would end up as it did, based on the frequencies of the vanilla parties. For example, suppose that 80% of vanilla conservatives are jingoist, and the rest are pro-military; then a pro-military conservative party has a 20% probability, multiplied by the similar probabilities from the other fields. The negative log of this probability is that party's contribution to the customisation pool.

Now, players may customise their nations, in this format:

```
KHA = {  
  liberal = {  
    area = trade_policy  
    position = free_trade  
  }  
  resource = {  
    which = iron  
    amount = 2  
  }  
  research = {  
    tech = late_enlightenment_philosophy  
    tech = freedom_of_trade  
    tech = private_banks  
    tech = water_wheel_power  
  }  
}
```

}

This says that the Khanate wants liberals who are in favour of Free Trade. (If it wanted to specify liberal positions on other points, it should make another 'liberals' entry.) Each country will attempt to buy the listed customisations in the order given; if it can't afford one, that entry is skipped. The cost of a customisation is equal to the negative log of its probability ratio, times the number of previously successful bids plus one. For example, suppose I want pro-military conservatives, probability 20%, but I got randomly-generated jingoists, probability 80%. (If they were randomly generated as pro-military, obviously, the customisation is skipped.) Then the cost of the customisation is $-\log(0.2/0.8) = 1.38$, times however many previous bids I had. The minimum cost is the number of prior successful bids, plus one; customisations that "go with the flow", ie in the direction of higher probability, will generally have the minimum cost. On the other hand, laissez-faire communists are going to be highly expensive.

An 'unless' clause may be added to a bid, in which case the bid will only be used if the party in question has a position other than the one indicated by the unless.

The 'resource' bid says that the nation would like its stockpile increased by 20 iron. Only resources which exist in some nation's stockpile at game start can be bid on in this way. The cost is equal to the negative logarithm of that resource's fraction of the world stockpile, times the number of units, times the number of previous successful bids plus one.

The research entry is not a bid, but just a list of the order in which the nation would like to use its research points to buy initial techs.

6 Miscellanea

- Armies and navies convert proportionally, that is, if you have one-tenth of the EU3 infantry you will get (approximately) one-tenth of the vanilla Vicky infantry. Note that this only applies to quite advanced EU3 units; low-tech armies convert to irregulars (still on the proportional system) and low-tech ships don't convert at all.
- Infamy converts one-for-one.
- Inflation converts to debt.

- High-level forts and ports convert to Vicky forts and naval bases.
- Government types convert as shown in config.txt.
- Army and navy tradition convert to leadership.