## Parameter Search

| Parameter | value | interpretation | Moment |
|---|---|---|---|
| $\gamma$ | 0.6 | Scale of GDP production | Labor share of GDP |
| $\epsilon$ | 2 | Elasticity of intertemporal substitution | From misallocation paper |
| $I$ | $e^{100}$ | initial number of inventors | Match initial number of patents |
| $\nu$ | 2.8 | ratio of firms to inventors | average GDP growth |
| $g_1, g_2$ | 0.066, 0.02 | growth rates of population | patent number growth |
| $\eta^L$ | 0 | reuse benefit | normalized |

Table 1: Parameters matched before-hand.

| Parameter | value | interpretation |
|---|---|---|
| $\eta^H$ | 0.3 | New technology benefit |
| $\eta^M$ | 0.07 | New combination benefit |
| $\tau$ | 500 | Shape parameter for idea distribution |
| $\xi$ | 200 | $1/\xi$ is the fraction of viable combinations |
| $\lambda$ | 1 | scale parameter of the cost distribution |
| $\kappa$ | 5 | shape parameter of the cost distribution |
| $\zeta$ | 0.012 | probability that tech line shuts down |

Table 2: Parameters from patent type fraction moment matching

| | **Data** | **Model** |
|---|---|---|
| **new tech 1850** | 0.4 | 0.08951 |
| **new comb 1850** | 0.25 | 0.38985 |
| **reuse 1850** | 0.35 | 0.52064 |
| **new tech 1900** | 0.03 | 0.024958 |
| **new comb 1900** | 0.45 | 0.41998 |
| **reuse 1900** | 0.52 | 0.55506 |
| **new tech 1950** | 0.02 | 0.016924 |
| **new comb 1950** | 0.75 | 0.71255 |
| **reuse 1950** | 0.33 | 0.27053 |
| **new tech 2000** | 0.01 | 0.014938 |
| **new comb 2000** | 0.8 | 0.88133 |
| **reuse 2000** | 0.19 | 0.10373 |
| **reuse peak** | 0.55 | 0.57473 |
| **peak year** | 34 | 53 |

Table 3: Moments (the missing column numbers are the moments I dropped relative to the old specification). Obs.: column 8 is not included as an argument in the objective function $\Rightarrow$ still under-identified.

# 1 Welfare Counterfactuals

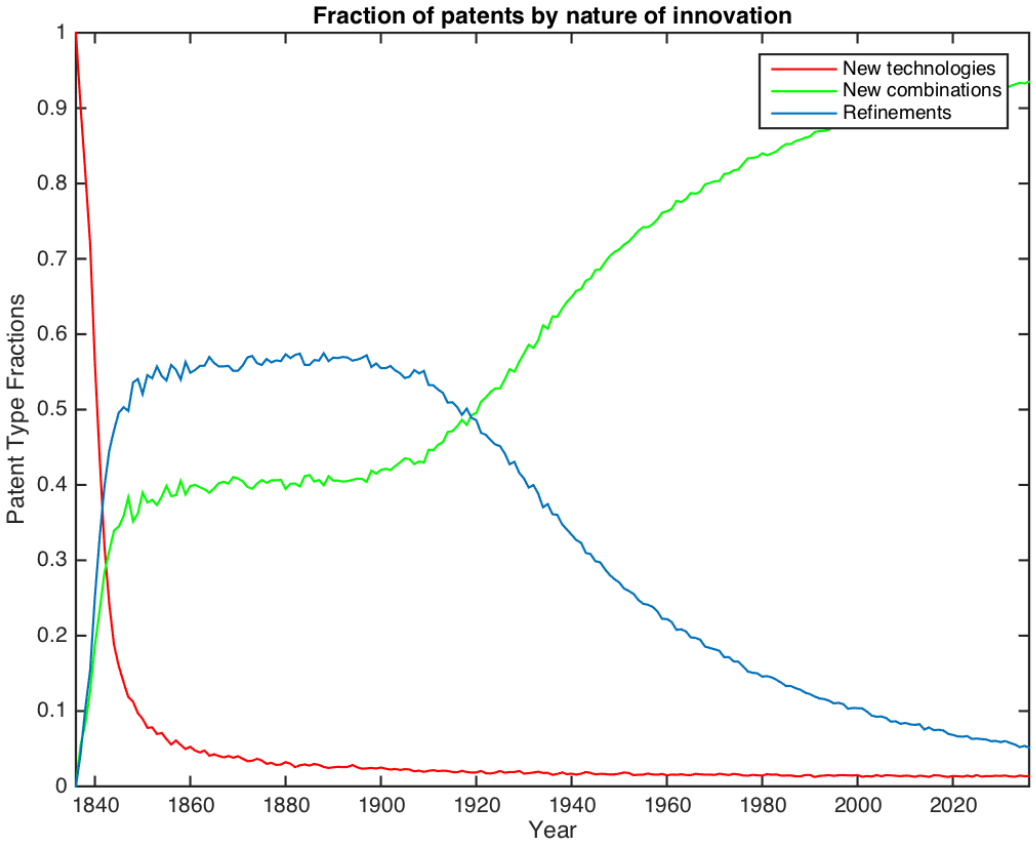


Figure 1: Fraction of patents by type

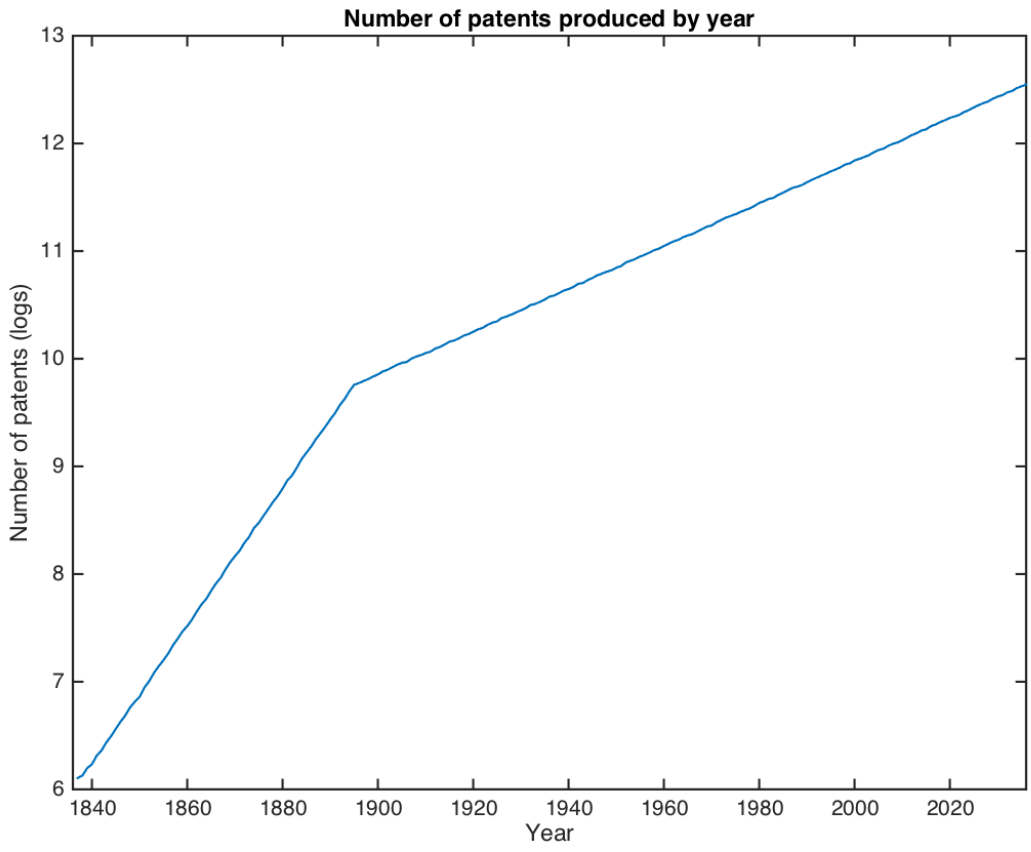


Figure 2: Number of patents produced

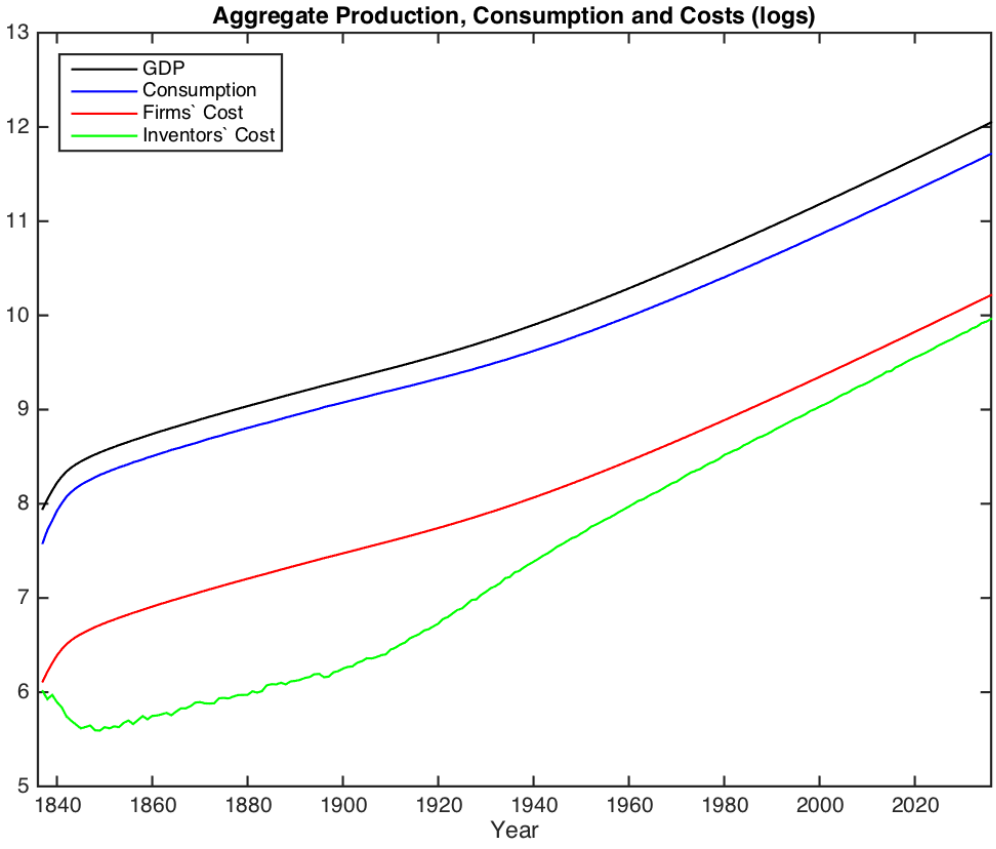


Figure 3: Aggregate variables in the final goods market clearing

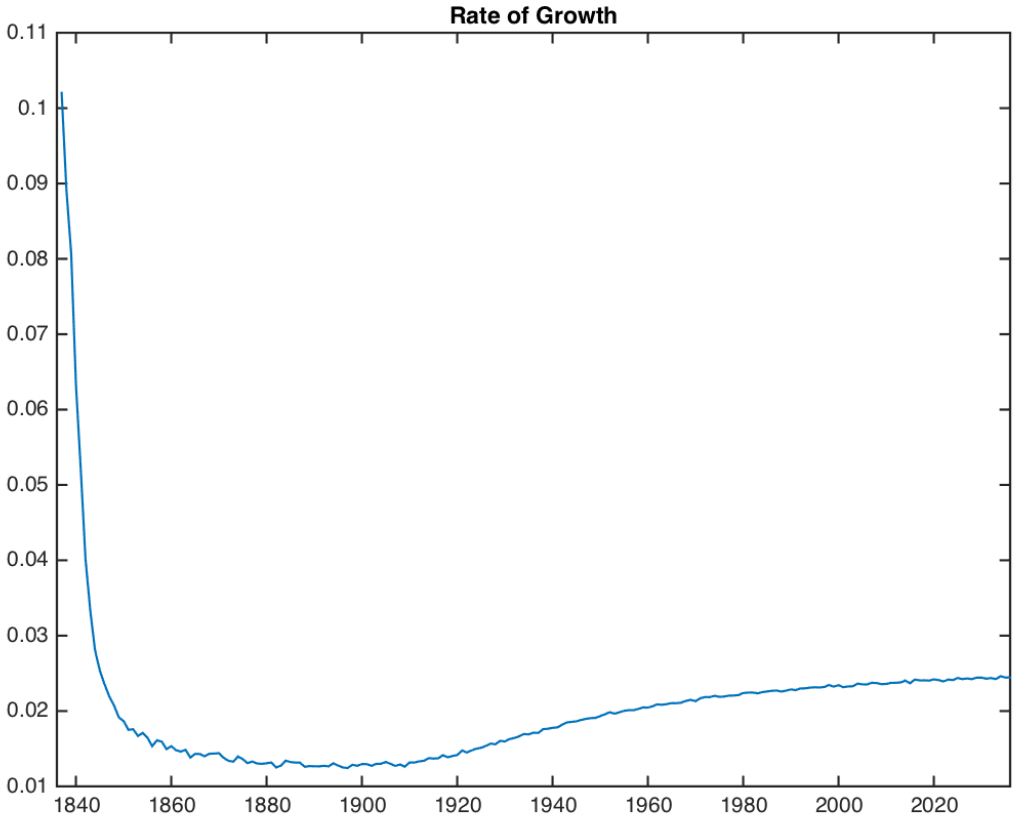


Figure 4: Rate of growth of the economy

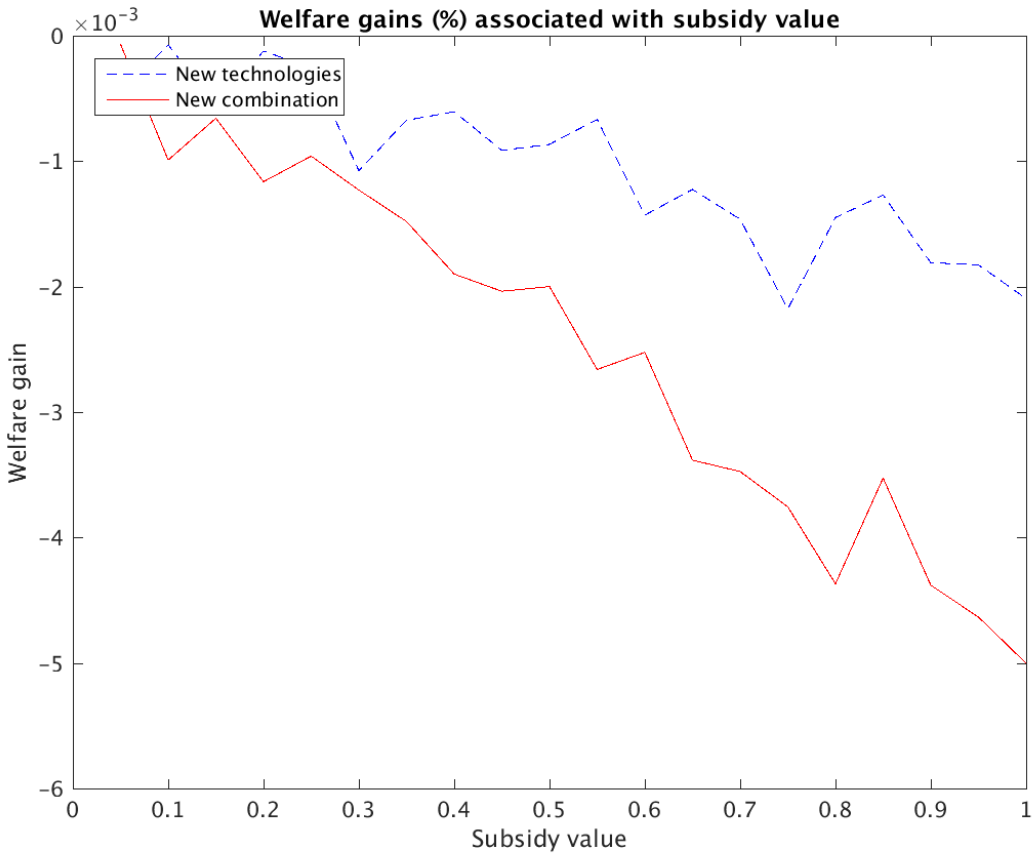


Figure 5: Difference in welfare gains between new combinations to new technology

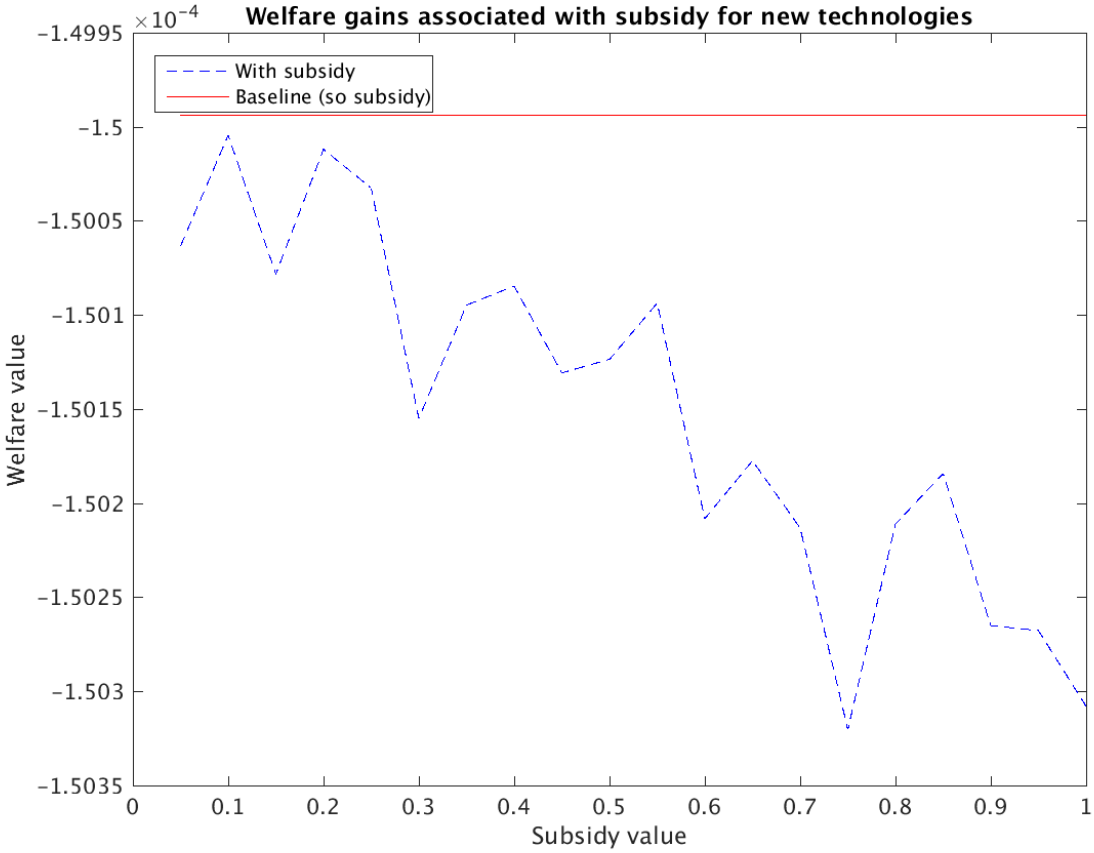


Figure 6: Welfare gains from subsidizing new technologies

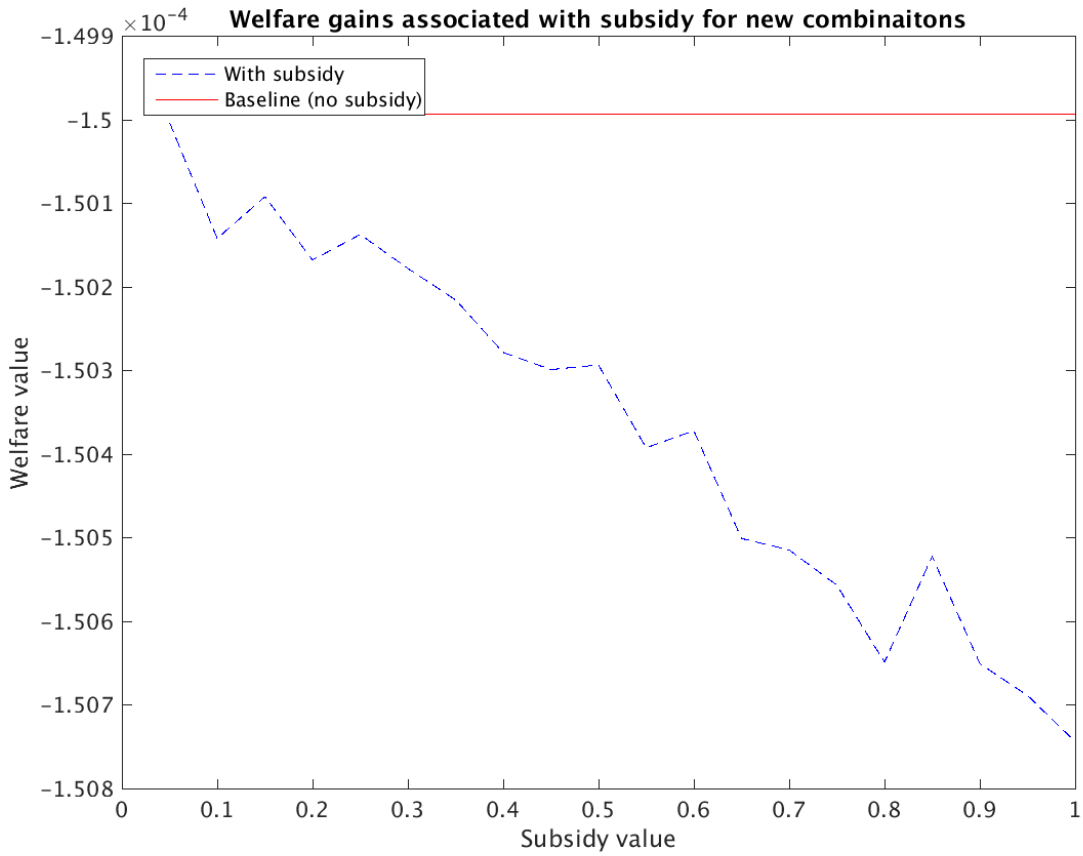


Figure 7: Welfare gains from subsidizing new combinations