Separate Appendix

A. Financial Contract To derive the solution of Section 2.2,[1] set taxes to zero for simplicity. Suppress subscript j and denote safe interest by r. Banks compete by offering a contract i, D, r, L that maximizes an entrepreneur's surplus in (3) with payment $(1+r)L$,

$$\pi^e = pv^e - H - E, \quad v^e \equiv I + f(I) - (1+i)D - (1+r)L + H. \tag{A.1}$$

To attract business, the bank maximizes π^E subject to incentive and participation constraints, the collateral constraint $L \leqslant (1-\beta)H$, and the financial identity $I = E+L+D$. Since the bank offers two types of lending, we have two independent participation constraints, $p(1+i)D - D \geqslant 0$ for risky debt and $(1+r)L - L \geqslant 0$ for safe debt. Given committment of own funds E and collateral, the program is

$$\begin{aligned} \pi^e &= \max_{i,r,D,L} pv^e - H - E + \mu \cdot [pv^e - \Gamma I] + \lambda^L \cdot rL \\ &: \quad +\lambda^D \cdot [p(1+i) - 1]D + \eta \cdot [(1-\beta)H - L]. \end{aligned} \tag{A.2}$$

Using $\rho = p(f' - i)$, the necessary conditions are

$$\begin{aligned} (i) \quad & i: \ 1 + \mu = \lambda^D, \\ (ii) \quad & r: \ (1+\mu)p = \lambda^L, \\ (iii) \quad & D: \ (1+\mu)\rho - \mu\Gamma + \lambda^D [p(1+i) - 1] = 0, \\ (iv) \quad & L: \ p(f' - r)(1+\mu) - \mu\Gamma + \lambda^L r = \eta. \end{aligned} \tag{A.3}$$

There are two possible regimes, constrained and unconstrained.

Unconstrained regime: When the incentive constraint is not binding, $pv^e > \Gamma I$, the Kuhn-Tucker-condition implies $\mu = 0$. Conditions (i-ii) yield positive multipliers $\lambda^D = 1$ and $\lambda^L = p$, implying that both participation constraints bind: $p(1+i) = 1$ and $r = 0$. Condition (iii) boils down to $\rho = p(f' - i) = 0$ which pins down unconstrained investment I such that $f'(I) = i$. Evaluating (iv) yields $\eta = pi > 0$ so that the collateral constraint binds. The bank lends safe credit $L = (1-\beta)H$ and risky debt, $D = I - E - L$.

[1] See Egger, Keuschnigg and Winner (2012), *Taxation and Incorporation*, University of St. Gallen.

Constrained regime: A binding incentive constraint, $\mu > 0$, implies $\lambda^D = 1+\mu$ and $\lambda^D = (1+\mu)\,p$. Both participation constraints bind, $p\,(1+i) = 1$ and $r = 0$. Evaluating (iii) shows that investment yields an excess return, $\rho = p\,(f' - i) = \Gamma\mu/\,(1+\mu) > 0$. Using this in (iv) yields $\eta/\,(1+\mu) = pf' - \Gamma\mu/\,(1+\mu) = pi$. With $\eta > 0$, the bank lends safe credit up to $L = (1-\beta)\,H$. Knowing L and using $D = I - E - L$, the constraint $pv^e = \Gamma I$ implicitly fixes investment and risky lending D. The incentive constraint is equivalent to $\pi = p\,[f\,(I) - iI] - (1-p)\,\beta H = \Gamma I - (E+H)$, see (10) and Figure 1.

B. GNP Identity We distinguish consumption of goods and of private assets (living in one's family house). Substituting π_j^* into (8) gives $W = C + \left[H - (1-p)\sum_j s_j \beta H_j\right]$ where goods consumption is $C = \sum_j s_j p\,[f\,(I_j) - iI_j] + A - (1-n)\,k$. In the expansion stage, $(1-p)\,s_j$ firms fail and must liquidate the house. However, H-consumption and welfare are reduced only by the consumer surplus or transaction cost βH_j. After liquidating, the house is sold to someone else with valuation L which is part of the 'housing consumption' in the square bracket above.

The loanable funds market is $A^f + \sum_j (n_j - s_j)\,E_j = \sum_j s_j\,(D_j + L_j) + (1-n)\,t_k k$. In a small open economy, supply stems from foreigners plus lending by failed entrepreneurs who are left with E_j. Demand stems from firms that raise safe and risky debt, and from government which issues debt to cover tax losses from deductions of fixed costs. Using $\sum_j n_j E_j - (1-n)\,t_k k = A - (1-n)\,k$ as well as $I_j = D_j + L_j + E_j$ yields

$$A^f = \textstyle\sum_j s_j I_j + (1-n)\,k - A. \tag{B.1}$$

Using (B.1) and $p\,(1+i) = 1$ yields the GNP identity $C = \sum_j s_j p\,[I_j + f\,(I_j)] - A^f$ where consumption equals (gross) output minus repayment of foreign debt. At the end of period, there is no new investment, the entire capital stock is disinvested and paid out. Hence, national goods consumption equals output together with undepreciated capital minus repayment to foreigners at a safe interest normalized to zero.