Central Bank Account for All: Efficiency and Risk Taking

Cyril Monnet (Bern and Gerzensee)
Asgerdur Pettersdottir (Bath and MPC Central Bank of Iceland)*
Mariana Rojas-Breu (Paris-Pantheon-Assas)

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***The views need not reflect those of the other MPC members of the Central Bank of Iceland**

Motivation

- CBDC on the agenda of many central banks

- One risk always pointed out: lower **level** of investment due to reduced demand for deposits (a.k.a disintermediation)

- But to avoid disintermediation, banks can adapt their business model
  - offer higher rates to depositors
  - modify the **type** of investments they make

This paper

- We study effects of CBDC on banks' balance sheet
  - in a model of monopolistic bank
  - with risk-averse depositors
  - no deposit insurance and
  - in a cashless economy

- Bank's balance sheet:
  Liabilities: The bank fund assets by issuing deposits (for CBDC)
  Assets: The bank invests (CBDC) in safe assets, risky assets, reserves

- Investigate the effect of higher CBDC remuneration

This paper

- 2 effects of higher CBDC remuneration
  - banks' funding becomes more expensive
  - Households demand more CBDC --> more funding for the bank

However:

- More funding --> scarcity of safe assets --> search for yield --> more risk

- May be optimal to increase interest on reserves (in response to ↑ CBDC)

Main ingredients of the model

- Lagos-Wright (2006) with a bank

- **Bank invests** in $\bar{h}$ projects (large)
  - q safe (monitored) projects: $q \to Rq$ at convex cost $\kappa(q)$

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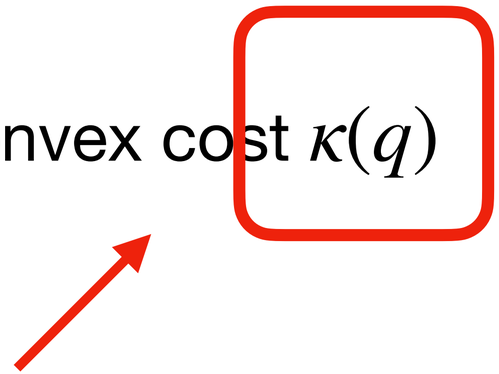

Monitoring too many projects is not profitable

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Aggregate risk: monitoring too few projects makes the bank risky

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- **Bank funds** investment by borrowing from households -- interest $(1+i_d)$

Main ingredients of the model (household side)

- Marginal cost of producing consumption good is 1

- Households demand CBDC (z) / bank deposit for consumption:

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- We assume z is increasing in $1+i_m$.

Benchmark Efficient Allocation

$$u'(c^*) = 1$$
$$R - \kappa'(q^*) = pR$$
$$n^* + q^* = \bar{h}\,.$$

Assume the interesting case where: $pR > 1$ and $c^* > Rq^*$

Bank's contract

- The bank offers a deposit contract (w_h, w_ℓ) to depositors, satisfying
- Participation constraint: $pu(w_h) + (1-p)u(w_\ell) \geq u((1+i_m)z)$

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- Promise keeping constraints: $w_\ell \leq Rq + (1+i_r)r$

$$w_h \leq R(n+q) + (1+i_r)r$$

Optimal contract as a function of funding

- If $i_m < i_m^1$, the bank only invests in safe projects, deposits are safe
- If $i_m^1 \leq i_m < i_m^2$, the bank invests in safe and risky projects, deposits are safe
- If $i_m^2 \leq i_m < i_m^3$, the bank invests in safe and risky projects, deposits are risky
- If $i_m^3 \leq i_m < \pi/\beta - 1$, the bank invests in safe and risky projects and reserves, deposits are risky

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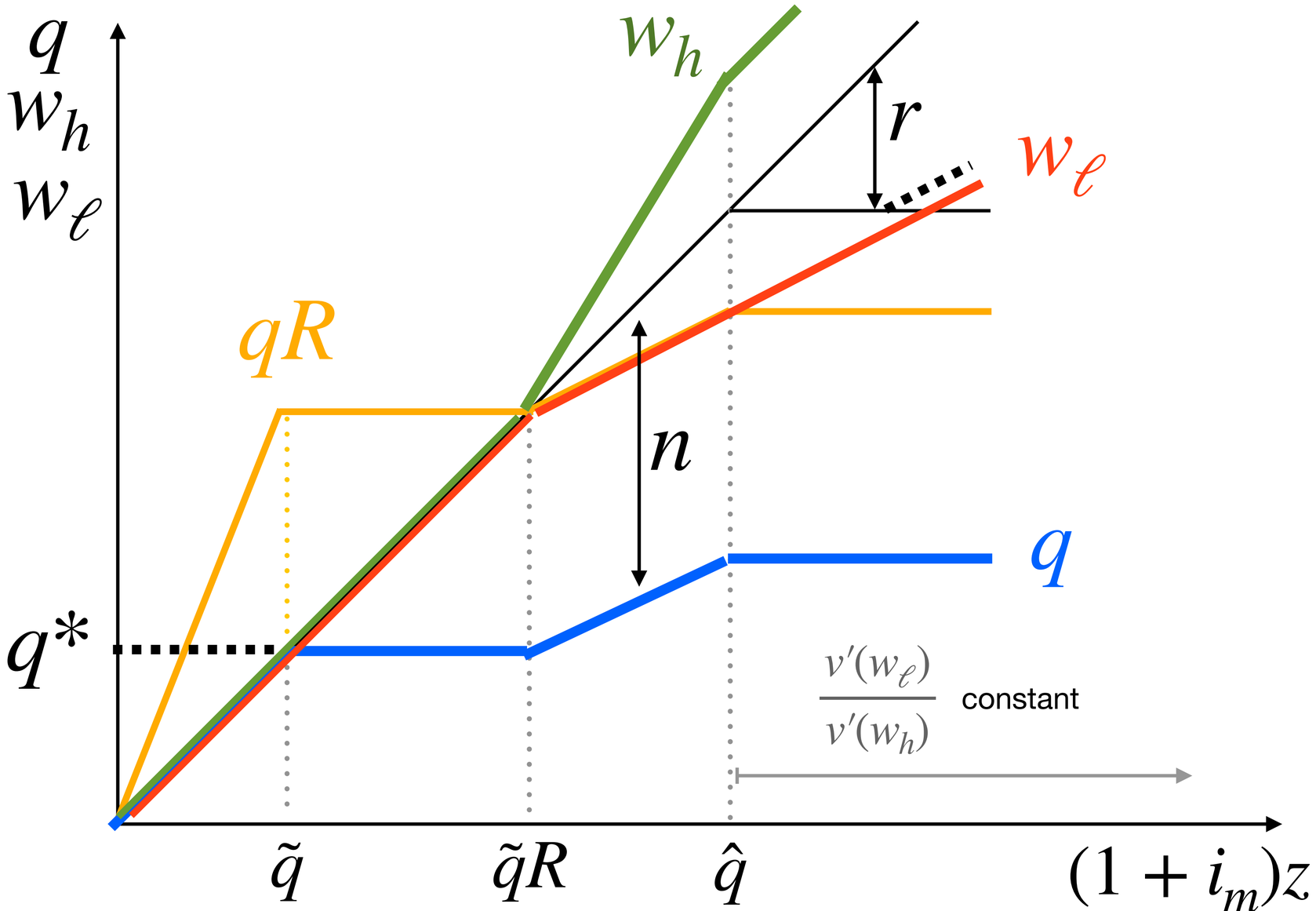

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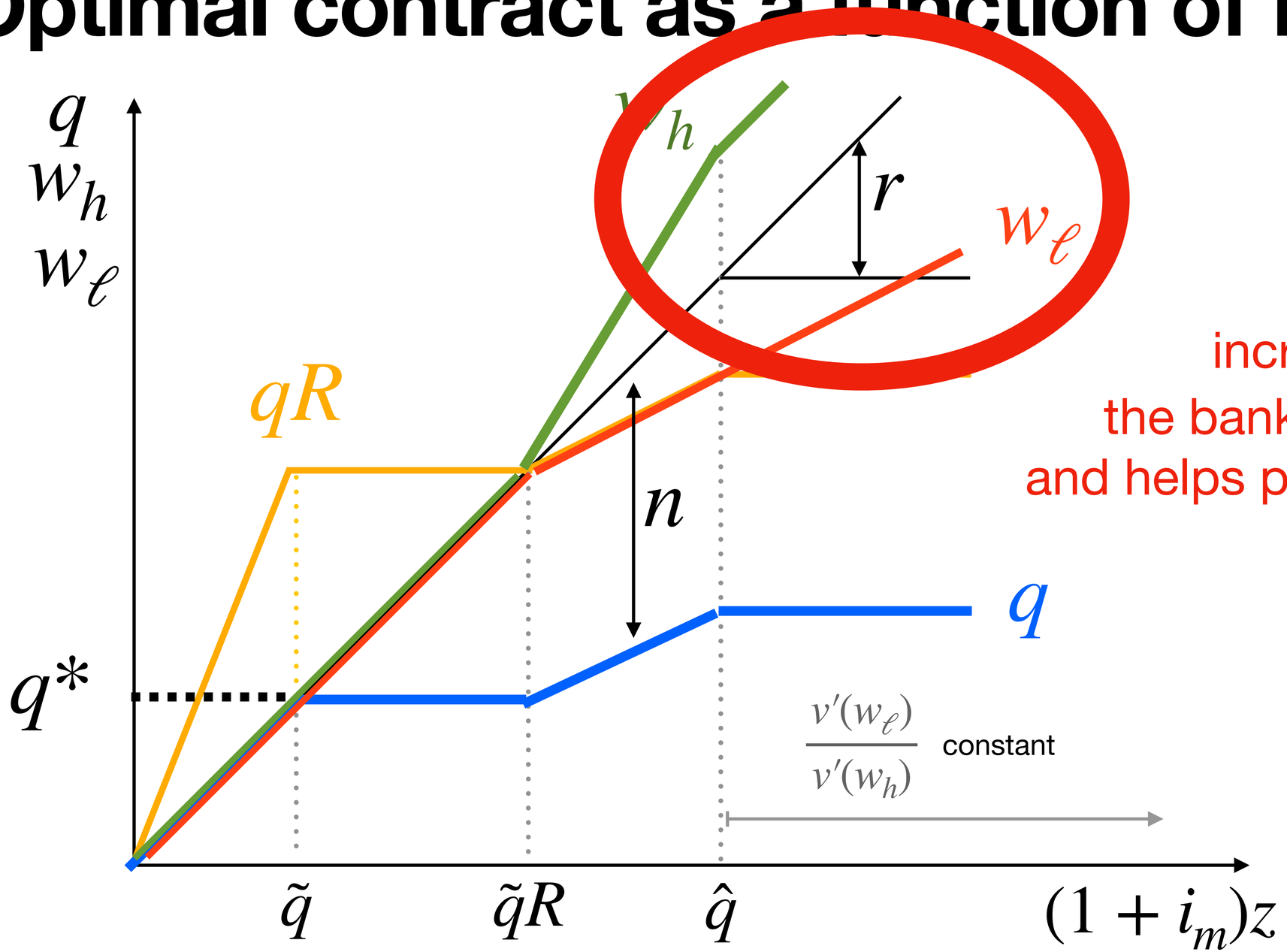

increasing $i_r - i_m$
the bank substitutes q for r
and helps provide more insurance

Effects of remunerated CBDC on banking sector

- Funding cost increases with i_m... but remunerating CBDC increases its puchasing power, thus reducing cost of investment --> no/little disintermediation (n+q)

- But distort invesments :
  - Banks seek a safer portfolio, investing too much in safe assets relative to q^*
  - while still investing more in risky assets: fragility in our model (no externality)

- Optimal policy is to increase the wedge $i_r - i_m$ to reduce q
  "Alleviate" the shortage of safe assets

Conclusion

- Low to moderate rate on CBDC increases welfare because it increases intermediation/investment

  - introducing risky investment does not impact this (known) result.

- Higher level of CBDC rate can yield to suboptimal investment and too much risk

- The wedge $i_r - i_m$ can promote investment efficiency