INSTITUTIONS AND THE RESOURCE CURSE

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Introduction

- **Stylized fact:** Natural resource abundant economies tend to grow slower than economies without substantial resources.
  - For e.g., growth losers, such as Nigeria, Zambia, Sierra Leone, Angola, Saudi Arabia and Venezuela, are all resource-rich, while the Asian tigers: Korea, Taiwan, Hong Kong and Singapore, are all resource-poor.
  - BUT many growth winners such as Botswana, Canada, Australia, and Norway are rich in resources.
- Of the 82 countries included in a World Bank study, 5 countries belong both to the top 8 according to their natural capital wealth and to the top 15 according to per capita income (World Bank, 1994).
- This paper investigates to what extent growth winners and growth losers differ systematically in their institutional arrangements.

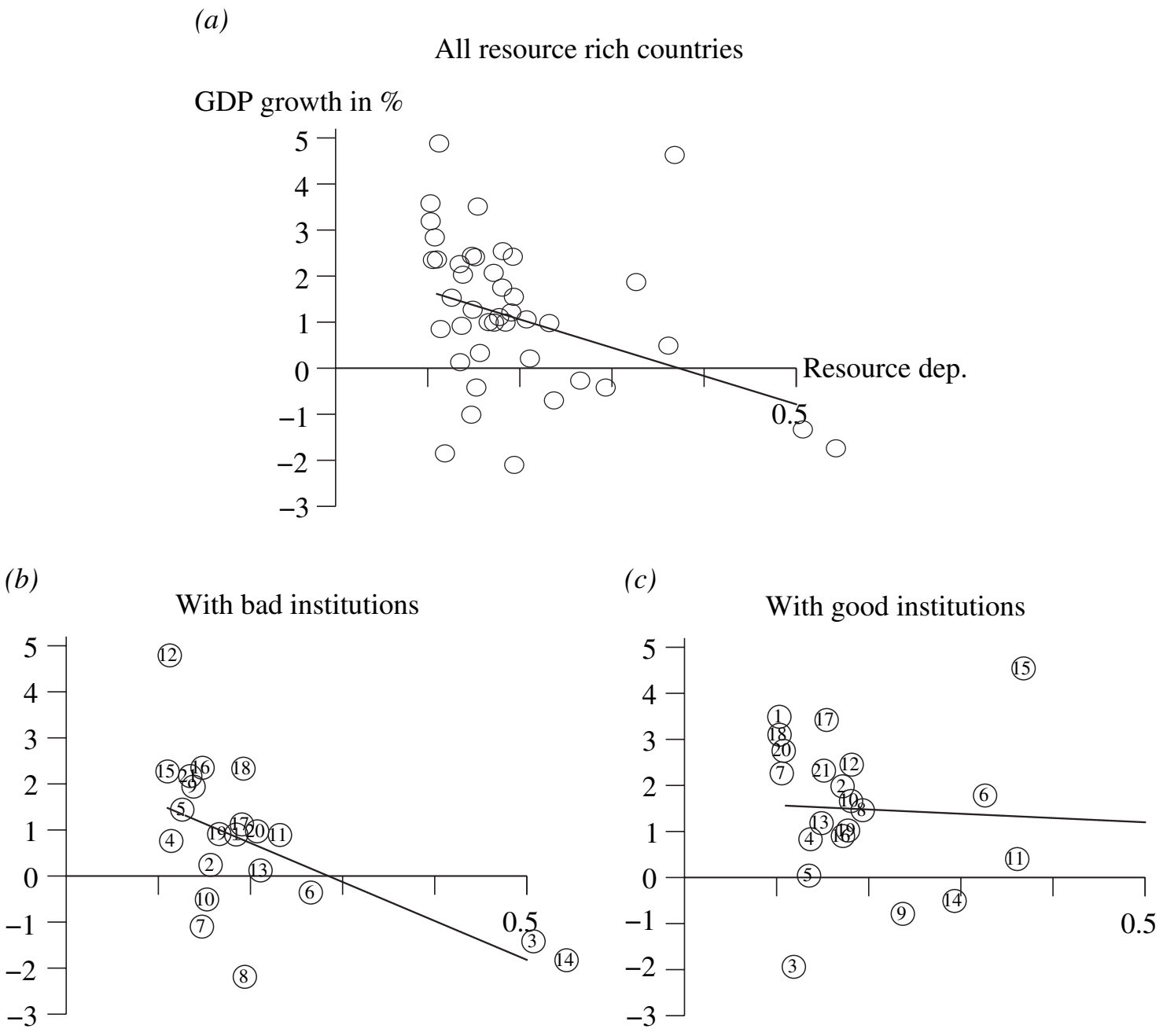

Fig. 1. *Resources and Institutions (a) all resource rich countries (b) with bad institutions (c) with good institutions*

Related Literature

- Sachs and Warner (1995) rent-seeking hypothesis: resource abundance leads to a fall in institutional quality in turn lowering growth. Found that this mechanism was empirically unimportant.
- Botswana, with 40% of GDP stemming from diamonds, has had the worlds highest growth rate since 1965. Acemoglu et al. (2002) attribute this remarkable performance to the good institutions of Botswana. Another example is Norway.
- There are also many examples of slow growth among resource rich countries with weak institutions. See Lane and Tornell (1996);Tornell and Lane (1999); Ades and Di Tella (1999); Acemoglu et al. (2004).
- In countries with weak states resource abundance stimulate violence, theft and looting, by financing rebel groups, warlord competition (Skaperdas, 2002), or civil wars. Collier and Hoeffler (2000) find that 'the extent of primary commodity exports is the largest single influence on the risk of conflict'.

The Model: Agents

- Entrepreneurs $N = n_P + n_G$ split between producers and grabbers.
- Institutional quality is λ; higher values imply more producer–friendly.
- Rents from natural resources is R.
- Pay-off π_G to a grabber is sR/N. Producer's resource rent: $\lambda sR/N$.
- Let $\alpha = n_P/N$. Hence, $s = \frac{1}{1-\alpha+\lambda\alpha}$.
- Producer's payoff $\pi_P = \pi + \lambda\pi_G$.

Production

- L workers and M different goods; each good can be produced in a modern firm or in a competitive fringe.
- Fringe: CRS technology, 1 unit of labour produces 1 unit of the good.
- Modern firm: one entrepreneur and requires a minimum of F units of labour. Each worker beyond F produces $\beta > 1$ units of output.
- Bertrand Price competition leads to $\pi = (1 - \frac{1}{\beta})y - F$ where y is the amount produced of every good.
- $Y = R + My = N[\alpha\pi_P + (1-\alpha)\pi_G] + L = L + R + n_P\pi$.
- This yields $y = \frac{\beta(L - n_P F)}{\beta(M - n_P) + n_P}$.

Production versus Grabbing

- Assume income in a completely industrialised economy is higher than in an economy without modern firms. So $\beta(L - MF) + R > L + R$.
- Hence, $\pi(n_P)$ is everywhere positive and increasing in n_P.
- Recall $\pi_P = \pi(\alpha N) + \lambda \pi_G$.
- Also, s is increasing in α for $\lambda \in [0, 1]$.
- Assume that the number of entrepreneurs and the profitability of modern production are sufficiently high to rule out the possibility of equilibria without a single producer. Formally, $R/N \leq \pi(0)$.
- Fix λ and look at how π_P and π_G vary with α (Figure 2).

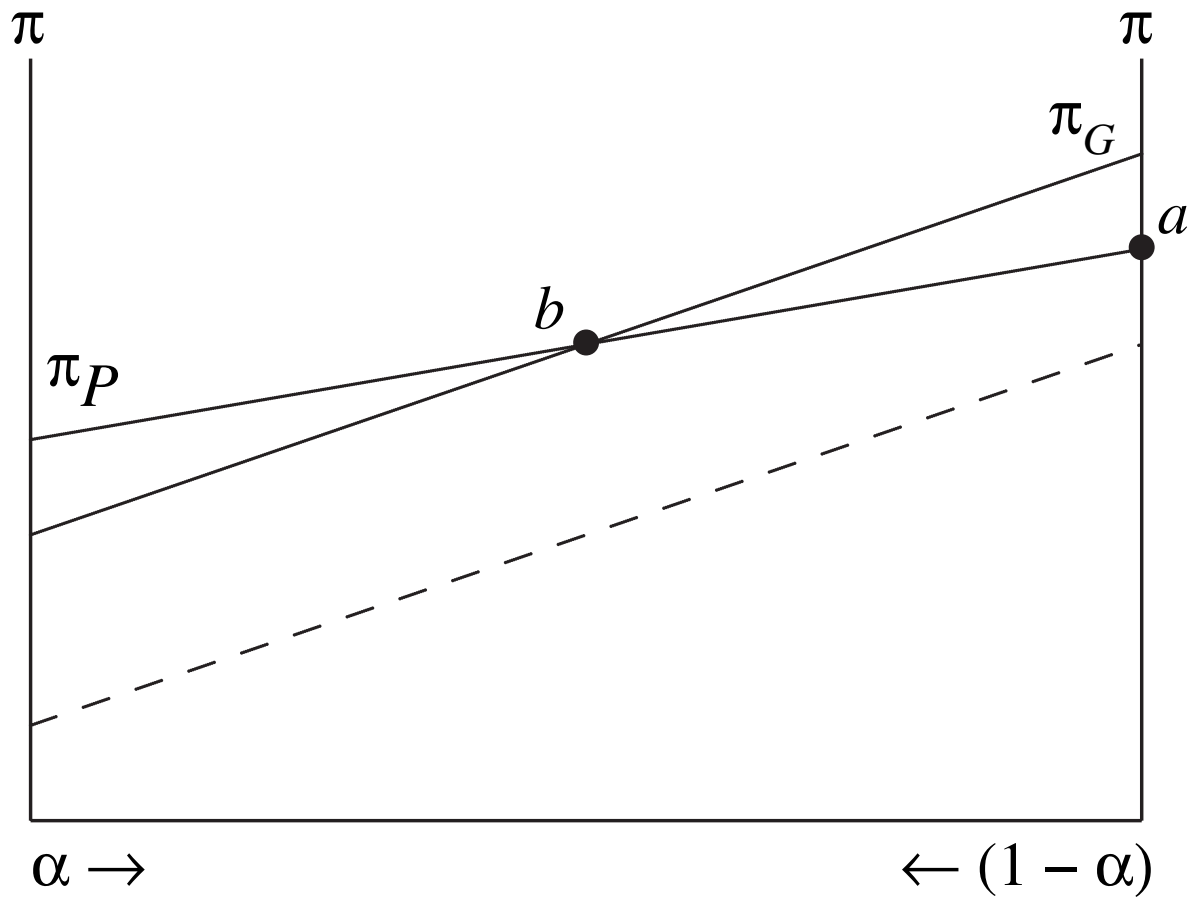

Fig. 2. *Resources and Rent Seeking*

Equilibria

- Two types of equilibria:
  1. Production equilibrium, where all entrepreneurs are producers (point a).
  2. Grabber equilibrium, where some entrepreneurs are producers and some are grabbers (point b).
- Total income in production eqbm. is $N\pi(N) + R + L$.
- Total income in grabbing eqbm. is $\frac{N}{1-\lambda}\pi(\alpha N) + L$.
- There will be an institutional threshold $\lambda = \lambda^*$ that determines in which of the two equilibria an economy ends up.
- λ^* implicitly defined by $\pi_G = \pi_P$ and $\alpha = 1$. So, $\lambda^* = \frac{R}{R+N\pi(N)}$.

Proposition 1. When institutional quality is high, $\lambda \geq \lambda^*$, the equilibrium is a production equilibrium. When the institutional quality is low, $\lambda < \lambda^*$, the equilibrium is a grabber equilibrium.

More results

Proposition 2. More natural resources is a pure blessing in a production equilibrium – a higher R raises national income. More natural resources is a curse in a grabber equilibrium – a higher R lowers national income.

- Two effects: the *immediate income effect* of a higher R is a one to one increase in national income; the *displacement effect* reduces national income as entrepreneurs move from production to grabbing.
- Here, the positive externality between producers implies that the opportunity cost of grabbing declines as entrepreneurs switch from production to grabbing.
- Falling opportunity cost magnifies the displacement effect; so, the displacement effect eventually dominates the immediate income effect.

Proposition 3. In the grabber equilibrium more producer friendly institutions increase profits both in grabbing and production, and thus leads to higher total income. In the production equilibrium a further increase in λ has no implications for total income.

More results

Proposition 4. In the grabber equilibrium a higher number of entrepreneurs N raises the number of producers n_P, lowers the number of rent-seekers n_G, and leads to higher profits in both activities.

- Let the growth of new entrepreneurs be $dN/dt = \theta - \delta N$. Long-run steady state $\overline{N} = \theta/\delta$.
- Using the definition of the institutional threshold λ^* define a resource threshold R^* such that $R^*(\overline{N}, \lambda) \equiv \frac{\lambda}{1-\lambda}\overline{N}\pi(\overline{N})$.
- A country with institutional quality λ and with long run number of entrepreneurs $\overline{N}$ will end up in a production equilibrium if and only if $R < R^*(\overline{N}, \lambda)$.
- Figure 3 for dynamics.

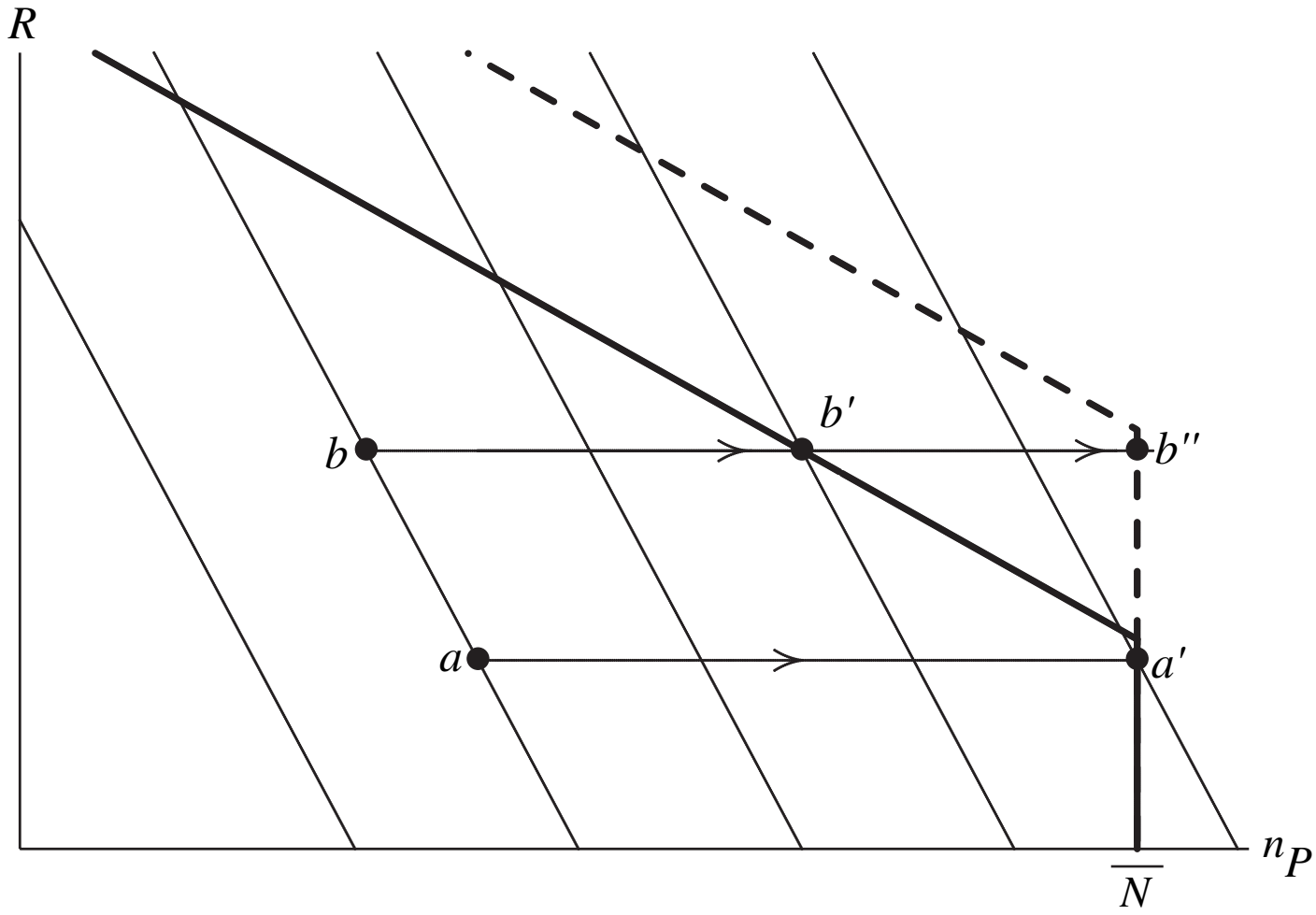

Fig. 3. *Resources and Rent Seeking*

Table 1

Regression Results I

Dependent variable: GDP growth.

	Regression 1	Regression 2	Regression 3	Regression 4
Initial income level	−0.79*	−1.02*	−1.28*	−1.26*
	(−3.80)	(−4.38)	(−6.65)	(−6.70)
Openness	3.06*	2.49*	1.45*	1.66*
	(7.23)	(4.99)	(3.36)	(3.87)
Resource abundance	−6.16*	−5.74*	−6.69*	−14.34*
	(−4.02)	(−3.78)	(−5.43)	(−4.21)
Institutional quality		2.2*	0.6	−1.3
		(2.04)	(0.64)	(−1.13)
Investments			0.15*	0.16*
			(6.73)	(7.15)
Interaction term				15.4*
				(2.40)
Observations	87	87	87	87
Adjusted R^2	0.50	0.52	0.69	0.71

Note: The numbers in brackets are t-values. A star (*) indicates that the estimate is significant at the 5-% level.

Table 2

Regression Results II

Dependent variable: GDP growth.

	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6
Initial income level	−1.33*	−1.88*	−1.33*	−1.34*	−1.36*	−1.45*
	(−6.26)	(−7.95)	(−5.90)	(−6.97)	(−6.13)	(−5.45)
Openness	1.87*	1.34*	1.60*	1.59*	1.63*	1.56*
	(3.77)	(3.20)	(3.47)	(3.73)	(3.76)	(3.36)
Resource abundance		−10.92*	−16.35*	−13.70*	14.78*	−16.25*
		(−3.16)	(−3.71)	(−4.00)	(−4.26)	(−3.60)
Mineral abundance	−17.71*					
	(−3.16)					
Institutional quality	−0.20	1.83	−0.90	−1.15	−1.18	−0.78
	(−0.22)	(−1.35)	(−0.69)	(−0.96)	(−0.94)	(−0.56)
Investments	0.15*	0.11*	0.15*	0.15*	0.15*	0.14*
	(6.25)	(4.09)	(5.56)	(6.51)	(6.76)	(4.91)
Interaction term	29.43*	11.01	18.31*	15.86*	16.84*	19.01*
	(2.66)	(1.84)	(2.34)	(2.45)	(2.55)	(2.41)
Secondary			−0.60			−0.57
			(−0.44)			(−0.41)
Ethnic frac.				−0.88		−0.77
				(1.69)		(1.12)
Language frac.					−0.36	−0.11*
					(0.75)	(0.18)
Africa exluded	no	yes	no	no	no	no
Observations	87	59	76	86	84	74
Adjusted R^2	0.63	0.79	0.70	0.71	0.70	0.70

Note: The numbers in brackets are t-values. A star (*) indicates that the estimate is significant at the 5-% level.

Conclusion

- Countries rich in natural resources constitute both growth losers and growth winners.
- This paper shows that the quality of institutions determines whether countries avoid the resource curse or not.
- The combination of grabber friendly institutions and resource abundance leads to low growth.
- Producer friendly institutions, however, help countries to take full advantage of their natural resources.