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On the promises and perils of Smithian growth – from pin factory to AI*

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Abstract

For path-breaking insights on how prices can guide the efficient allocation of resources and on how innovation and investment can spur economic growth, Adam Smith is justly renowned. He was, however, well aware of problems posed by market dominance – specifically in banking and, more generally, wherever getting to the scale that delivers increasing returns leads to monopolistic behaviour.

For the historical record, we draw on the recent wide-ranging survey by Acemoglu and Johnson on how the benefits of innovation have been spread across society since the Industrial Revolution. We also consider these issues in the context of geo-political competition.

(100 words)

Keywords: *The Wealth of Nations* by Adam Smith; Increasing Returns to Scale; monopoly; excess risk-taking; case studies of economic history; geo-political competition.

JEL Codes: B12, D61, E25, L12, O33, P51

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Smith's claim - that the selfish human urge to increase profits is the basis of collective wealth - is one of the most revolutionary ideas in human history.

Yuval Harari, *A Brief History of Humankind* (2011, p.148)

1. Introduction

Economic growth financed by the investment of profits was a key feature of the Industrial Revolution. From Harari's point of view, indeed, this provided a welcome relief from agricultural production, for he regarded the Agricultural Revolution as history's 'biggest fraud'. 'The average farmer worked harder than the average forager, and got a worse diet in return', Harari (2011, p.90).

For Adam Smith, as his discussion of the pin-factory makes clear, the source of economic growth lay not in natural endowments but in specialisation. This creates its own resource base, as Amartya Sen put it:

The benefits of specialization, economies of scale, and skill formation create and expand opportunities for trade and exchange. To get the benefits of specialization in some field, a country does not have to be, Smith's reasoning indicated, blessed with a pre-existing resource base giving it a natural advantage: *specialisation creates its own resource base*. Sen (2016, p. 286) [italics added]

How this worked out in practice is discussed in the next section, where we draw on the fascinating study by Acemoglu and Johnson (2023). They consider two key cases. First is the Industrial Revolution in Britain, beginning in the mid-eighteenth century (when Adam Smith was writing) and running on through the nineteenth: second is the USA post-WWII, when America had decisively assumed the role of world technological leader.

Despite significant differences between the two, a consistent message seems to emerge: that, in addition to the impact of technological change on labour productivity, its impact on the incomes and conditions of labour depends substantially on the social and political forces prevailing - which can, and do, shift over time.

For the USA post WWII, for example, the authors distinguish two distinct phases: a 'golden age' of win-win post-war growth for both labour and capital;

followed by a ‘neo-liberal era’ of automation and disempowerment of labour¹. The latter was accompanied by a shareholder value revolution, inspired in part by the Friedman doctrine that ‘the social responsibility of business is to increase its profits’, and associated with greatly increased concentration of the industrial landscape – and of banking and finance as well.

Accordingly, section three focuses on issues of market power, and the gains from specialisation. It is well known that Adam Smith was critical of monopoly power, especially in banking where he perceived it to be associated with excessive risk-taking. For manufacturing and commerce, he saw a clear tension between getting to the scale that delivers increasing returns and checking the monopolistic behaviour that may well follow - with the East India Company as an all too evident exemplar of corporate excess, including the use of gross military power and violence.

Milton Friedman was a great admirer of Adam Smith: so how is one to account for his forthright support for private business vis-à-vis government regulation *despite the evidence of increasing concentration and corporate power in the USA post WWII*? We suggest it may have been due to viewing things through the prism of geo-political competition between democratic market economies in the West and state-planned autocracies in the East. When, in the fourth section, we turn to considering such wider issues – such as why the Industrial Revolution happened when and where it did! – it is readily apparent that history has an important part to play. In this context, we note how Gerard Roland’s recent study of the “deep historical roots of modern culture” appears broadly to bear out the geopolitical East/West division that so concerned Milton Friedman. We also observe that the *Narrow Corridor* of Acemoglu and Robinson (2019) provides a neat contrast between a societal balance that promises progress and the threat of paralysis under tyranny when individualism is left unprotected.

The paper ends by noting that the recent rapid development of AI poses issues of social control afresh for our time. The question is whether the development and distribution of this powerful new technology be left in the hands of large corporations competing against each other for private profit; or whether the risks this poses for society “ought to be restrained by the laws of all governments”, as Smith might have put it.

¹ See also Reich (2015) for a similar distinction.

2. The virtuous spiral of development: in theory and in practice

Granted that specialisation can provide the economy with a resource base, why should this lead to a process of continuing growth? For an answer, we turn to Duncan Foley's study where he offers the following account of what he dubs the 'virtuous spiral of economic development':

The links between the division of labor and the extent of the market create a system of positive feedbacks, in which increases in the division of labor lower costs, raise real incomes, and extend the market, thus leading back to more increases in the division of labor. This process creates a self-reinforcing positive spiral of economic development. For Smith, this positive feedback process is the deep secret of the wealth of nations. Foley (2016, p. 10)

That may be the theory; but what happened in practice? On this, there are contrasting views. Writing in 1848, for example, the historian and Whig politician Thomas Macaulay provided an unashamedly upbeat assessment of progress up to and including the Industrial Revolution. 'The history of our country during the last hundred and sixty years is eminently the history of physical, of moral, and of intellectual improvement. .. no man who is correctly informed as to the past will be disposed to take a morose or desponding view of the present.' Macaulay (1848).

Of this celebrated author of the *History of England* it was once said: "I wish I was as sure of anything as Macaulay is of everything".² Nevertheless, in their recent book on *Power and Progress: Our thousand-year struggle over technology and prosperity*, Daron Acemoglu and Simon Johnson, hereafter A&J, challenge the optimism of what is known as the Whig interpretation of history.

To operate successfully for society as a whole, they claim, the virtuous spiral of development must satisfy two preconditions: the existence of improvements in worker marginal productivity, and of sufficient bargaining power for labour A&J (2023 p. 196). Unfortunately, they reckon, neither was satisfied for the period Macaulay refers to in his *History*!

Their robust challenge to the Whig view of English history is summarized in the upper panel of Table 1 below, where the period of the Industrial Revolution is

² Attributed to the politician William Windham, a contemporary of Macaulay.

divided into two phases, the first from mid-18th century to 1840, and the second running on almost until WWI. After a brief characterisation of economic developments for each phase in column 1, their views on whether the necessary conditions were satisfied or not are given in the next two columns, with key political developments of relevance listed in the final column.

Industrial Revolution In Britain	2. Economic developments for labour	3. Improvements in worker marginal productivity?	4. Sufficient bargaining power for labour?	5. Political developments
First Phase 1750 – 1840	Fairly rapid productivity growth, but real incomes moved little.	Not for unskilled labour, with longer hours, more discipline. many skilled jobs also wiped out by automation	Largely absent. Workers not unionized; and employers imposing harsh discipline.	First Reform Act 1832; but all Chartists' Petitions rejected by Parliament .
Second Phase 1840-1910 'Age of countervailing powers'	90% increase in labour productivity, with real wage increase of 123% p.195	Technology increased productivity in transport, iron and steel, with new opportunities for labour	Trade Union Act of 1867 legalized unions	Reform Acts of 1867 and 1872, and legislation of 1154 widened franchise to 2/3 of men
Post WWII in US				
First Phase 1945-1975 'Thirty Glorious Years'	TFP growth approx. 2.2% p.a. Median real wage growth 2.5% p.a.	Alongside automation new opportunities for all kinds of workers (p.258)	Productivity and profit gains split between capital and labour	Incremental strengthening of labour movement and of regulatory state continued.
Second Phase 1975-2005 'Reversal: automation and worker disempowerment'	TFP growth less than 0.7% p.a. since 1980. Median real wage growth only 0.45% p.a.	Automation prioritized, ignoring creation of new tasks for workers (p.259) Spread in offshoring	Fall in the labour share of income, from 67-70% towards 60%. Offshoring worsens conditions for labour.	New approach to antitrust and regulation of monopoly: onus now on government to prove harm.

Table 1 Developments in successive technological leaders: UK (1780 - to WWI); USA (from WWII to 2005). Source: Acemoglu and Johnson (2023)

In phase one of the Industrial Revolution, it is argued, automation was used to eliminate skilled jobs. With the laws of the land preventing workers from acting in concert, moreover, employers could take advantage of the increased labour productivity that followed from technical progress by imposing harsh labour discipline, accompanied by little increase in real wages. As a consequence, working conditions were much closer to what Friedrich Engels was to describe in *The condition of the Working Class in England in 1844* than to Macaulay's contemporaneous assessment in his *History of England*.

In the second phase, however, things changed substantially as unions were legalised and the parliamentary franchise widened - and both preconditions for the virtuous spiral were fulfilled. Labour productivity continued to grow at about 1% p.a., but real wages grew faster as the benefits were shared with workers, and technology improvements provided new opportunities for labour - in the train industry, for example.

What this suggests is that, for labour, the impact of technological progress is not predetermined; it depends on how technology improvements are introduced and how the productivity gains are shared.

As leadership in technical change passed to the USA in the twentieth century, the lower panel of the table analyses American experience in two thirty-year phases following WWII. In this case, the authors note, the force of socio-political pressure and management practice led to earlier gains for labour later being reversed.

In the first phase, with incremental strengthening of the labour movement and of the regulatory environment, both preconditions were satisfied; so technological improvements led to real wage growth of 2.5% p.a. and the provision of new tasks for workers displaced by these improvements. When, in the second phase, productivity growth slowed down markedly, median real wage growth fell to less than half of one percent per year. With management prioritizing automation of existing jobs, with little concern for creating new tasks for those displaced, there was a marked fall in the labour share of national income.

[For its relevance to this discussion, the Annex summarizes the argument of an earlier paper they cite, Acemoglu and Restrepo (2018), hereafter A&R, which modifies the usual production function by treating the inputs of labour and capital as distributed among various tasks. Thus in A&R it is argued that the

effect on the demand for labour in the US due to the changing allocation of tasks has been responsible for its falling its share of national income in the last 40 years.]

Though the recent pattern of progress and prosperity for the US is quite different from what they describe for the Industrial Revolution in Britain, the authors derive a similar conclusion – how the fruits of technological change are distributed depends on social and political pressures³.

In this context, they draw particular attention to the “Friedman Doctrine: that the social responsibility of business is essentially to increase profits”, published by Milton Friedman in 1970. They reckon that, together Michael Jensen’s recommendation that compensation of corporate managers be tied to the value they create for shareholders, this was meant to ensure that unregulated markets, combined with the productivity bandwagon, would work for the common good. But the ensuing “shareholder value revolution” had the predictable effect of altering the balance between managers and workers as “good CEOs did not have to pay high wages. Their social responsibility was solely to the shareholders.” A&R (2023, p. 272).

Another effect was to encourage a new approach to antitrust and the regulation of monopoly, articulated by Robert Bork, Richard Nixon’s solicitor general. “At the centre was the idea that large corporations dominating the market were not necessarily a problem that required government intervention. The key question was whether they harmed consumers by raising prices and the onus was on the government to prove they were doing so.” A&R (2023, pp. 275,6).

This new antitrust approach has, they argue, been critical in allowing for the expansion of large corporations, so that the largest five US corporations are now worth one-fifth of US GDP - compared to one-tenth of US GDP at the beginning of the twentieth century. As Robert Reich (2015, p.40) pointed out, moreover:

Unlike the old monopolists, who controlled production, the new monopolists control networks. Antitrust laws often busted up the old monopolists, but the new monopolists have enough influence to keep antitrust at bay.

³ Though not cited, this perspective on USA post WWII is much the same as that of Robert Reich, Secretary of Labor from 1993 to 1997 in President Clinton’s cabinet; see, for example, his *Saving Capitalism: For the Many, Not the Few*, published in 2015.

As Reich went on to note, the financial sector was also being monopolized. “By 2004, Wall Street’s five largest Banks held about 45 percent of America’s banking assets, up from about 25 percent in 2000.” More than that, it was being deregulated.

In the decades leading up to the near financial meltdown of 2008, the biggest banks had already grown much larger and more profitable by persuading Congress and presidential administrations to dismantle many of the laws and rules that had been enacted in the wake of the Great Crash of 1929 to prevent big banks from making excessively risky bets. Reich (2015, p.42)

In the essay on economic development by Amartya Sen already cited, we read:

Even as the positive contributions of market processes and profit motives were being clarified and explicated in a pioneering way by Adam Smith, their negative sides were already becoming clear – to Smith himself. The balancing of the power and achievements of the market mechanism, on the one side, against the limitations of that mechanism, on the other, was quite central to Smith’s analysis of political economy. Sen (2016, p.287)

So where did Adam Smith himself stand on such issues; and with what implications for today?

3. Market Power, Risk-taking and the Gains from Specialisation

3 (a) On banking: the need for regulation to prevent excessive risk-taking

Adam Smith famously cited the butcher, the brewer and the baker to show how competitive market forces can benefit the consumer. What about the banker?

While he was working on *The Wealth of Nations*, Smith was distracted by the serious losses that the Duke of Buccleuch (for whom he was acting as adviser) suffered due to the collapse of the Ayr Bank where he was an investor at a time of unlimited liability for banks in Scotland.⁴

Subsequently, Smith does in fact describe the collapse of the Ayr Bank in 1772 and criticises it for taking excessive risks in its ambition ‘by drawing the whole

⁴ “The collapse of the Ayr Bank, and the paramount need to save Buccleuch from disaster, dragged Smith away from his work.” Norman (2018, p. 83)

banking business to themselves, to supplant all the other Scotch banks' (WN II.ii.73-75, pp. 313-314)⁵. He is led to conclude that:

Those exertions of natural liberty of a few individuals, which might endanger the security of the whole society, are, and ought to be, restrained by the laws of all governments. ... The obligation of building party walls, in order to prevent the communication of fire, is a violation of natural liberty, exactly of the same kind with the regulations of the banking trade which are here proposed. (WN II.ii. 94 p. 324)

This reference to building party walls has contemporary resonance in the UK. For, at the instigation of John Vickers, a 'ring fence' was thrown around risky activities of UK banks after the banking crisis of 2008, in an effort to separate high-risk investment banking from the everyday obligations of commercial banking!⁶

The speech to shareholders by Gordon Gekko, abrasive investment banker in the 1987 movie *Wall Street*, has the unforgettable punchline:

The point is, ladies and gentlemen, that greed, for lack of a better word, is good. Greed is right, greed works. Greed clarifies, cuts through, and captures the essence of the evolutionary spirit.

Smith's experience and views on banking evidently led him to a very different conclusion!

Nevertheless, in his memorial lecture at Adam Smith's birthplace in Scotland, Alan Greenspan (2005), then Chairman of the Federal Reserve System, suggested that the Invisible Hand also applied to finance; and spoke in favour of financial deregulation. But that was before the 2008 financial crisis threatened a repeat performance of the Great Depression⁷.

3(b) On trade and manufacturing: an abiding tension

Turning to Smith's analysis of how trade and manufacturing contribute to the wealth of the nation, one observes an abiding tension. Thanks to the operation of 'the invisible hand', there is the promise of efficiency in a competitive

⁵ The effects of monopoly and excess risk-taking are analysed in Miller and Zhang (2011), using the Diamond-Dybvig model of banking for the purpose.

⁶ As recommended for the UK by the Final Report of the Independent Commission on Banking (2011), chaired by John Vickers, and later put into legislative effect.

⁷ Averted, it is widely agreed, by prompt intervention on the part of the 'three musketeers' - Hank Paulson at the US Treasury, Ben Bernanke as Chairman of the Fed, and Tim Geithner at the NY Fed, see Bernanke et al.(2016).

economy, with prices directing profit-maximising firms to produce what consumers want to buy. But the benefits of specialisation and skill formation - leading to economies of scale in the process of production – has features that challenge the viability of perfect competition. For as Tjalling Koopmans observed wryly in one of his *Essays on the State of Economic Science*:

The importance of indivisibilities for the phenomenon of increasing returns to the scale of the individual productive establishment and of the industrial conglomeration are generally realized. So are the implications of this phenomenon for the life expectancy of perfect competition in any given industry. Koopmans (1957)

These issues involve the First and Second Fundamental Theorems of Welfare Economics, in the parlance of Mas-Colell et al. (1995, pp.549-555), hereafter MGW. The First Theorem – that the price equilibrium of a Competitive Economy is Pareto Optimal – provides technical confirmation of Adam Smith's 'invisible hand', they argue⁸.

So far, so good. But to show, as per the Second Theorem, that any Pareto Efficient allocation can be achieved as a Competitive Equilibrium, calls for convexity in preferences and production⁹. So the exploitation of Increasing Returns To Scale (IRTS) may not be consistent with perfect competition.

This important point is illustrated in a figure for the one-producer, one-consumer economy, MGW (1995, p.529), reproduced below.

⁸ subject to the local non-satiation of preference, but with no appeal to convexity

⁹ To ensure that the prices will 'separate' the sets of utility prospects and production possibilities, as required for market clearing.

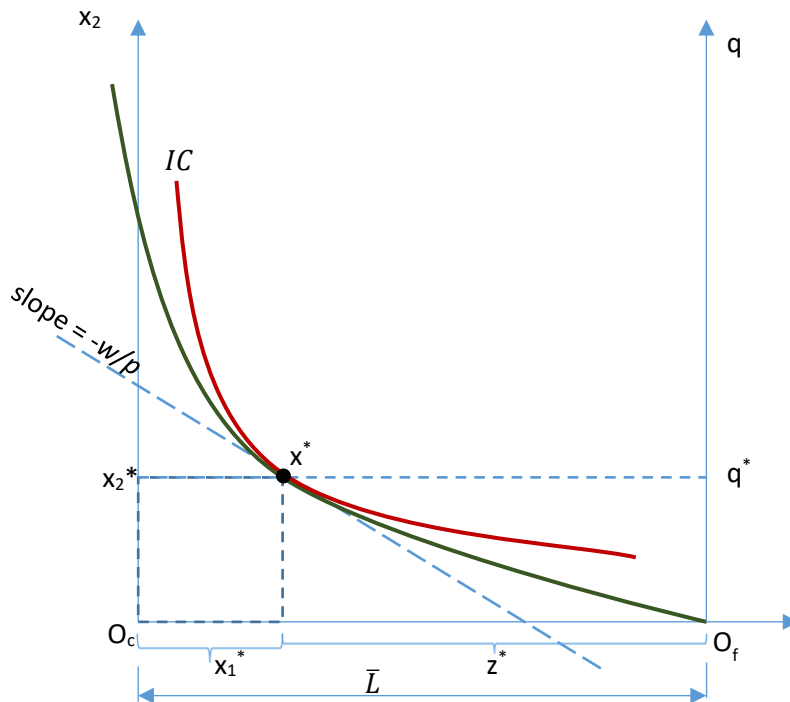


Figure 1 Failure of second welfare theorem with nonconvex technology

In this figure the producer pays w for the supply of labour z to produce quantity q of the consumer good, using a production function starting from O_f and exhibiting increasing returns to scale. The consumer with indifference curve IC (shown with respect to origin O_c) uses the proceeds of supplying z^* of labour endowment \bar{L} to purchase x_2^* of the produced good at price p , while retaining x_1^* as leisure. As the authors explain:

x^* maximises the welfare of the consumer utility for the consumer, but for the only value of relative prices that could support this as a utility-maximizing bundle, *the firm does not maximise profits even locally* (i.e., at the relative prices w/p , there are production possibilities arbitrarily close to x^* yielding higher profits). MGW (1995, p.528) [italics added]

Observe that, in the case shown, producing at the Pareto optimal point x^* will actually involve the firm making losses, as labour costs exceed receipts from the sale of output. (That this is so is evident since the consumer's -dashed - budget line intersects the horizontal axis to the left of O_f : that the losses are passed on to the consumer is indicated graphically by the budget line heading to intersect the vertical axis to right below zero by the extent of these losses.)

In such circumstances, therefore, Pareto efficiency is not achievable by the invisible hand.

Evidently the presence of non-convexities serves to undermine general proofs of the sustainability of Pareto optima as Competitive equilibria. There are, nevertheless, important examples where the presence of IRTS is quite consistent with a Pareto efficient competitive equilibrium. The textbook case of an industry with many identical firms possessed of identical U-shaped average cost curves (where increasing returns give way to decreasing returns beyond a certain scale) is a familiar example: for here the industry supply curve is horizontal and “the equilibrium outcome maximizes Marshallian aggregate surplus.” MGW (1995, p.339). So the welfare implications of IRTS will depend on specific market conditions.

The following passage describes, however, the tension Smith perceived between the potential benefit to the public of a wider market and the welfare loss due to monopolistic producers or ‘dealers’ (i.e. employers who live by profits).

The interest of the dealers, however, in any particular branch of trade or manufactures, is always in some respects different from, and even opposite to, that of the publick. To widen the market and to narrow competition is always in the interest of the dealers. To widen the market may frequently be agreeable enough to the interest of the publick; but to narrow the competition must always be against it, and can only serve to enable the dealers by raising their profits above what they naturally would be, to levy, for their own benefit, an absurd tax upon the rest of their fellow citizens. (WN I.xi,p.10, p.267)

An egregious example of a powerful monopoly in action when Smith was writing was the East India Company, founded in 1600. Its ‘monopoly of colony trade’ is, in fact, covered in some detail (WN.IV.vii,c, pp. 631-641) concluding with the damning observation that:

Such exclusive companies, therefore, are nuisances in every respect; always more or less inconvenient to the countries in which they are established, and destructive to those who have the misfortune to fall under their government.

How this private company wielded the enormous power afforded by its state-sanctioned monopoly is spelled out in harrowing detail in *The Anarchy: The Relentless Rise of the East India Company* by William Dalrymple. The narrative ends with this chilling reflection on its significance for our times:

The 300-year-old question of how to deal with the power and perils of large multinational corporations remains today without a clear answer: it is not obviously apparent how a nation state can adequately protect itself and its citizens from corporate excess. No contemporary corporation could get away with duplicating the violence and sheer military might of the East India Company, but many have attempted to match its success at bending state power to its own ends. Dalrymple (2020, p. 395)

3 (c) The invisible hand and the clash of civilisations

The warnings from Adam Smith - and the lessons from history itself - prompt the question: why was Friedman so ready to endorse a market-driven solution, even when this was likely to increase the power of large corporations and to reduce competition?

The introductory chapter of *Free to Choose: a personal statement*, Friedman (1980), co-authored with his wife, may provide the answer. It begins with a ringing endorsement of the invisible hand together with the declaration of inalienable Rights to Life, Liberty and the Pursuit of Happiness.

The story of the United States is the story of an economic miracle and a political miracle that was made possible by the translation into practice of two sets of ideas – both formulated in documents published in the same year, 1776.

One set of ideas was embodied in *The Wealth of Nations*, the masterpiece that established the Scotsman Adam Smith as the father of modern economics. ... The second set was embodied in the *Declaration of Independence*, drafted by Thomas Jefferson, [which] proclaimed a new nation, the first in history established on the principle that every person is entitled to pursue his own values.The combination of economic and political *freedom* produced a golden age in both Britain and in the United States in the nineteenth century. Friedman (1980, pp. 1,2)

The example that follows, although it refers to agriculture not manufacturing industry, may help provide an answer to the question posed above.

The fecundity of freedom is demonstrated most dramatically and clearly in agriculture. ...Today it takes fewer than one out of twenty works to feed a population of 220 million inhabitants and provide a surplus that makes the United States the largest single exporter of food in the world.

What produced this miracle? Clearly not central direction by government – nations like Russia and its satellites, mainland China, Yugoslavia and India today that rely on central direction employ from one quarter to one-half of their workers in agriculture, yet frequently rely on U.S. agriculture to avoid mass starvation. Friedman (1980, p. 3)

This comparison of stellar progress in the U.S. with that of state-controlled societies elsewhere does, perhaps, reveal the motivation for the unqualified endorsement of the 'invisible hand': namely to promote the success of democratic capitalism in the West vis-à-vis state planning and control in the East.¹⁰ The image of Friedman, in the television series that went along with the book, gleefully mocking the heavy hand of powers behind the Berlin Wall, and claiming that free markets are in fact more powerful, has the same unforgettable quality as Gordon Gekko's speech!

This leads us to make wider cultural comparisons in the next section.

4. Wider cultural considerations and current issues

Adam Smith took considerable interest in the history of economic development, including the potential significance of geography and natural resources. But when it came to analysing the gains from trade - unlike Ricardo who focused on contrasting resource endowments - Smith concentrated on the benefits to be had from specialisation and the increasing returns to scale¹¹. Such an industrial focus prompts the perennial question: so why did the Industrial Revolution start in eighteenth century Britain?

4 (a) Acemoglu and Johnson: 'A Middling sort of Revolution'

The answer supplied by Acemoglu and Johnson draws heavily on the evolution of British society since the imposition of a feudal system by the Normans following the successful Conquest of 1066. Their narrative covers many events: how the powers of the sovereign were modified by the Magna Carta of 1215; the shock of Henry the Eighth breaking with the Catholic Church in 1534; the

¹⁰ That Milton Friedman's parents migrated to the US from Carpathian Ruthenia, a historical region on the border between Central and Eastern Europe, mostly located in western Ukraine, may well be relevant.

¹¹ As was noted above In the citation from Amartya Sen (2016, p.286)

growth in the power of Parliament vis a vis the monarch with the execution of Charles I and the ensuing Civil War; and the 'Glorious Revolution' of 1688 which established 'constitutional monarchy'.

The end-result was a society in which the power of the sovereign was checked, and where individualism could flourish. They stress in particular the role played by entrepreneurs, often people of humble birth who - to make money and advance their social status - used their skills to invent and implement the technology of the Industrial Revolution.

4(b) Roland's 'deep historical roots'

Such a perspective – where the hand of history plays a large part in shaping modern civilisation - has been further explored in recent empirical work by Gerard Roland (2018). He tests the hypotheses that, historically, countries ranged between those with centralized or statist governance and those that were more market-oriented and individualistic; and that modern societies tend to bear the fruit of their deep historical roots, i.e. reflect the type of government of their respective 'founding civilizations'.

A simplified illustration of this approach – including data for four of the countries Friedman refers to in the *Personal Statement*– is provided in Figure 2.

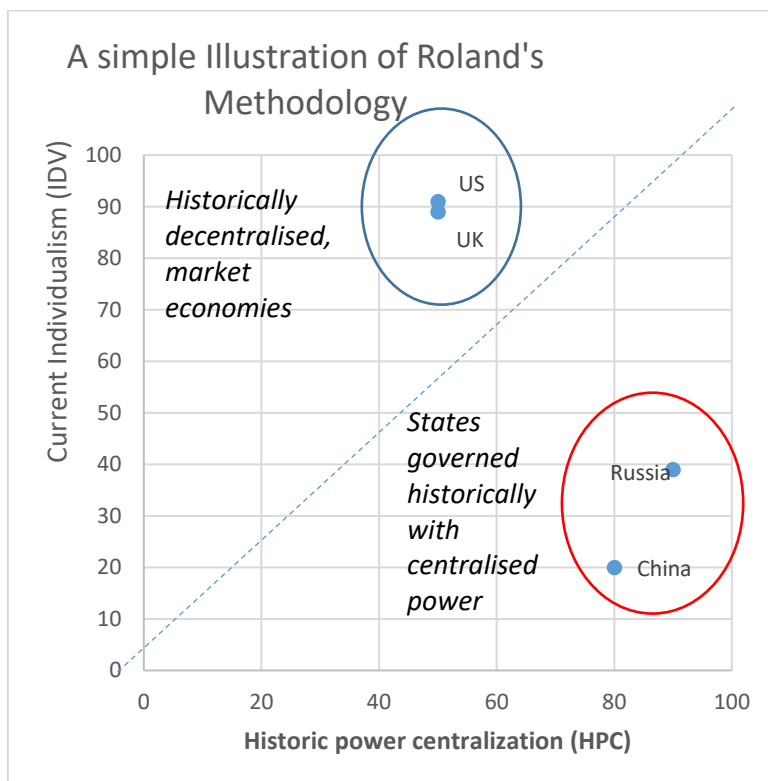


Figure 2 Contrasting ‘clusters’ showing the association of current culture with ‘deep historical roots’

On the horizontal axis is an index – the measure of ‘power centralization’ in Roland’s *historical* dataset - representing the power of the state vis a vis that of the people in the founding civilisation (where 100 would indicate absolute totalitarian control, and zero would indicate complete anarchy). On the vertical axis is an index representing the *current* degree of ‘individualism’ in the same society (as measured specifically by its score on the relevant Hofstede index).

The negative association between the centralization of power in the founding civilisation and the current score for individualism in any country is indicated by the relative position of the two ‘clusters’ shown in the figure. The pairs of UK and US, and of China and Russia, shown as specific examples, appear to bear out Roland’s hypotheses - and to illustrate the sentiments expressed in Friedman’s *Personal Statement*.

How successful this perspective of prolonged persistence may prove is open to debate, however. How does it fit with evolution - or with revolutions - one may well ask.¹²

4(c) The ‘Narrow Corridor’ of Acemoglu and Robinson

In the light of such issues, such a static perspective may be compared with the more explicitly dynamic formulation proposed by Acemoglu and Robinson, hereafter A&R. In *The Narrow Corridor: how Nations Struggle for Liberty*, A&R (2019), they develop a contingent, game-theoretic perspective, where political liberty may - or may not - emerge from a social struggle¹³. The struggle they describe is between society (the people) and the state, where the latter is represented by elite institutions and leaders. But, as Acemoglu (2019) explains: “You need this conflict to be balanced. An imbalance is detrimental to liberty. If society is too weak, that leads to despotism. But on the other side, if society is too strong, that results in weak states that are unable to protect their citizens.”

To illustrate how this creates a ‘narrow corridor’ in which liberty flourishes, they present their approach in a diagram, see Figure 3, where political

¹² Miller (2023) provides some further discussion.

¹³ This approach received the enthusiastic endorsement of Avinash Dixit (2021) in an extended review which covers the technical details with his customary clarity.

outcomes depend on the relative strength or ‘power’ of the two parties engaged in a dynamic, non-cooperative game – rather like two firms competing to patent a new product or process.

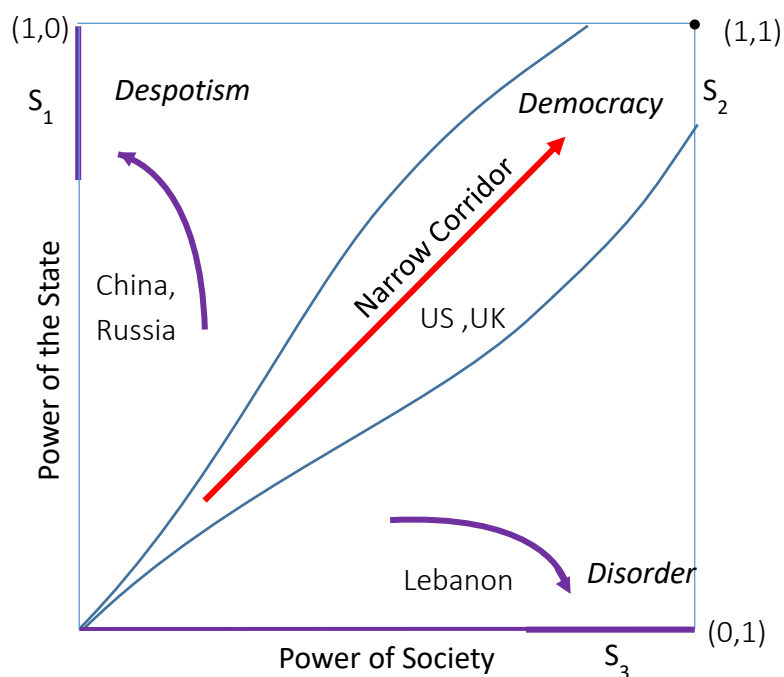


Figure 3 How the power of state and society can evolve

In the Narrow Corridor around the diagonal - where the two powers are in approximate balance – liberal democracy prevails and growth is encouraged, as indicated by the arrow pointing upper right. Outside this corridor, however, the stronger party is assumed to enjoy increasing returns, while the weaker suffers from a fatal ‘discouragement effect’. Hence paths outside the corridor

lead to divergent outcomes labelled Despotism and Disorder, where either Society or the State ultimately loses all power.¹⁴

The need to preserve a balance of powers in pursuing growth along the Narrow Corridor seems to match the recipe for shared prosperity advocated in the recent study by Acemoglu and Johnson(2023). While the path of Despotism, which conforms to Acton’s Dictum that ‘power tends to corrupt, and absolute power corrupts absolutely’, seems to capture what Friedman most feared – the overweening power of the tyrannical state¹⁵.

Recent rapid development of AI poses such issues afresh in our time. Should control of the development and distribution of this powerful new technology be left in the hands of large corporations? If not, how best should it be regulated so as to serve the interests of wider society? As Steve Hawking once said: “Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks.”

5. Conclusion - Adam’s admonition

Recognising the capacity of the profit motive to stimulate the technological development and capital investment sufficient to spur growth in a market-based economic system was a revolutionary idea.

But Adam Smith was aware of the tension between achieving the productivity benefits of new technology and ensuring that these get distributed around society. He was critical of monopoly power in general - colonial monopolies in particular - and of entrepreneurial risk-taking with negative externalities for society as a whole.

We may in the near future face a technological trap – a ‘race to the bottom’ as individual companies in search of profits compete to develop AI, even though the end-result of creating super-human software is potentially hazardous. As we have seen, Adam Smith’s view is that “the exertions of natural liberty of a few individuals, which might endanger the security of the whole society, are, and ought to be, restrained by the laws of all governments.” (WN II.ii. 94 p. 324)

¹⁴ For an analysis of the impact of Populism using this framework, see Miller and Zissimos (2022).

¹⁵ Why Friedman, who claimed to speak for everyman, should have backed big business instead of a balance of power as the right way to check tyranny and preserve freedom in America is, for me, an enduring puzzle.

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Annex: The elasticity of substitution, ‘task-assignment’ and factor shares

To account for shifts in the share of income taken by different factors of production, such as that observed in the US since the mid-1970s, it is conventional to assume an aggregate production function with unchanging coefficients measuring the contributions of the various factors; and to consider the impact of changing factor inputs.

In the basic case of Cobb-Douglas production, for example, output is a weighted average of the factor inputs (all measured in logs), so

$$Y = \Pi(\gamma L + (1 - \gamma)K)$$

where the productivity weights, γ and $1 - \gamma$ are taken to be predetermined. As the elasticity of factor substitution, σ , in the Cobb-Douglas formulation is unity, however, income shares are also fixed - even when factor inputs vary¹⁶.

Consequently the more flexible CES formulation is typically used, so

$$Y = \Pi(\gamma L^\rho + (1 - \gamma)K^\rho)^{1/\rho} \quad \text{where } \rho = (\sigma - 1)/\sigma$$

and σ can lie above or below unity. In this case, changes in factor shares can be 'explained' by changes in relative factor supplies.

Thus Piketty and Zucman (2015), for example, account for the rise in the capital share in the US and other rich countries since the 1970s, as shown in their Figure 15.25, by the rise in the capital/ labour ratio, assuming $\sigma > 1$ (so capital may be substituted for labour without requiring a matching fall in its relative cost). As they observe:

One can obtain substantial movements in the capital share with a production function that is only moderately more flexible than the standard Cobb-Douglas function. For instance, with $\sigma = 1.5$, the capital share rises from 28% to 36% if the wealth–income ratio $[K/Y]$ jumps from 2.5 to 5, which is roughly what has happened in rich countries since the 1970s. Piketty and Zucman (2015, paragraph below Figure 15.25)

In his discussion of the Industrial Revolution, however, Leijonhufvud (1986, p. 203) criticises the neoclassical treatment of production:

It does not describe production as a process, i.e. as an ordered sequence of operations. It is more like a recipe for bouillabaisse where all the ingredients are dumped in a pot, (K,L) , heated up, $f(\cdot)$, and the output, X , is ready.

Leijonhufvud goes into some detail in an effort to correct this mis-specification in the article cited. But here we turn instead to an idea explored recently in a series of papers by Acemoglu and Restrepo which have a similar inspiration.

¹⁶ As factor prices adjust to offset the impact of changes in supply.

As explained in A&R(2015), for example, this idea is that the essential units of the production process are various ‘tasks’ that have to be done, tasks which may be assigned either to labour or to capital. Output depends on the completion of all these tasks, so there is, as usual, complementarity between the various factors of production. But the coefficients in the production function – corresponding to the fixed weights γ and $1-\gamma$ in the previous neoclassical formulations – now become endogenous, reflecting the choices made by those responsible for task assignment (typically the managers).

Assuming a constant elasticity of substitution between tasks, the authors are able to aggregate these tasks and come up with the following CES formulation:

$$Y = \Pi(I, N) \{ \Gamma(I, N)^{1/\sigma} (A^L L)^\rho + (1 - \Gamma(I, N))^{1/\sigma} (A^K K)^\rho \}^{1/\rho}$$

where $\sigma = (\rho - 1)/\rho$, and where the coefficients of production, $\Gamma(I, N)$ and $1 - \Gamma(I, N)$ are now endogenous, depending on the parameters I (representing the introduction of an automation technology) and N (corresponding to the introduction of new labor-intensive tasks).

A&R distinguish between two forces that affect the labour share of income. First is the substitution effect triggered by shifts in relative factor prices, the only force influencing the labour share in the canonical model, discussed above, where the impact of changing factor supplies depends on whether σ is greater or less than one.

[Second and] more novel are the effects of the task content of production, $\Gamma(I, N)$... Intuitively, as more tasks are allocated to capital instead of labor, the task content shifts against labor and the labor share will decline unambiguously. Our model thus predicts that, *independently of the elasticity of substitution, σ , automation* (which reduces the task content of production against labor) will reduce the labor share in the industry, while *new tasks* (which alter the task content of production in favour of labor) will increase it. A&R(2019, p. 9) [emphasis added]

Despite assuming an elasticity of substitution less than one (specifically $\sigma = 0.8$), their ‘demand side’ multisector investigation of US industry¹⁷ is nevertheless able to account for the rise in the capital share in the US over the period 1987-2017 as a result of task assignment which varies over time. Thus the section labelled ‘Sources of Labor Demand: 1947-1987’ concludes:

¹⁷ Where they embed their model of tasks and production in an economy with multiple industries

In summary, the deceleration of labor demand growth over the last 30 years is due to a combination of anemic productivity growth and adverse shifts in the task contents of production owing to rapid automation that is not being counterbalanced by the creation of new tasks. (A&R, 2019, p.21)

It is worth observing that the approach taken by A&R is one where the Friedman Doctrine could play an important role: for if managers are persuaded that their principal obligation is to produce profits for shareholders, then reducing the tasks assigned to labour seems a likely corollary.

Their account might also help to explain the part played by ‘enlightened’ employers in the Industrial Revolution, when the newly developed processes of production involved enormous externalities affecting the health and welfare of workers, especially the young¹⁸ - as Friedrich Engels’s description of working conditions was to make abundantly clear. Employers who treated labour as fellow ‘stakeholders’ – to use modern terminology¹⁹ - would presumably have been motivated to take such externalities into account when assigning tasks.

How to assess the merits of these competing supply-side and demand-side approaches – or how they may be combined? A reaction appropriate for a non-specialist might be to echo the words of the apocryphal nineteenth century applicant for admission to Oxford University, who, when asked to distinguish between the major and minor prophets of the Old Testament, replied: “Far be it from me to make such an invidious distinction between such holy men.”

¹⁸ A&J (2023, p.185) refer to young children being used to push coal carts with their heads, for example.

¹⁹ As in Mayer (2013), for example, where proposals are presented for reshaping the modern corporation.