

Signal failure

How can we get more value and
less waste from our education system?

Aveek Bhattacharya
Chris Percy

SMF

**Social Market
Foundation**

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EXECUTIVE SUMMARY

This paper discusses the issue of signalling in education – the possibility that some forms of education may do little directly to improve learners’ skills and effectiveness, but may be used primarily to demonstrate or ‘signal’ their pre-existing traits or ability. In the UK, this is particularly pertinent to higher education, given concerns about increasing student numbers amid rising numbers of degree holders in non-graduate employment, a declining wage premium, and unnecessary credentialisation by some employers.

The extent and significance of signalling in our education system is strongly contested. We review a number of studies that use different methods to try and estimate the proportion of the value of education that can be attributed to signalling. Though they produce a wide range of values, it is at least plausible that between 20% and 40% of the wage benefit of education is due to signalling. That proportion is likely to be greater for higher education than earlier stages or courses focused on basic skills, and will vary significantly across individuals, course choices, and career journeys.

While the academic debate is likely to continue to rage, the near certainty of at least some signalling, combined with the vast resources invested in education, means that billions of pounds and years of students’ lives are at risk of being wasted in an individual arms-race to demonstrate pre-existing talent that does little to improve productivity.

Nothing in this paper denies the potential for education to add enormously to our public and private lives. Indeed, human capital development is only one of several rationales for personal and taxpayer investment in education. Nonetheless, the desire for economic and self-improvement is an important – often primary – motivation for students pursuing higher education. Out of respect for students alone, we would do well to ensure education is promoting personal growth as much as possible, to understand the career and wage benefit of education, and to guard against its erosion. The role of individual class and background – in accessing credentials, in distorting signals, and in affecting how credential-empowered signalling works in the labour market – provides a further reason to take this topic seriously.

The purpose of this paper is to consider how to reduce waste in the education system. Instead of seeking to resolve the debate over whether signalling exists, we ask how we might go about limiting its negative consequences without sacrificing its benefits. We suggest three complementary ways forward for policy: risk mitigation, structural change, and improving our understanding of signalling.

Risk mitigation

We should seek to identify ‘risk factors’ for educational pathways that are more likely to involve signalling and nudge learners away from them towards options that positively enhance their abilities. More evidence is needed to understand what exactly this would entail, but on the basis of informed speculation, we might consider the following:

- In response to the long duration of many university courses – which may encourage some students to study well beyond the point where they have

demonstrated what they need to signal or may discourage students from dropping out due to ‘sunk cost’ thinking - we might encourage **shorter, more modular courses** and offer more opportunities to **try or change courses**, without sacrificing any of the content difficulty that ensures succeeding in the course remains an honest signal of prior ability.

- In response to ‘default pathism’, which encourages some students to ‘follow the herd’ for fear of sending a negative signal, we suggest **investment in career guidance, greater support for work experience, and more breaks in education**.
- In response to the plausible assumption that older learners have a better understanding of their career goals and skill needs and are less likely to need signalling to compete in the labour market, we propose **greater investment in adult education**.
- In response to the potentially greater risk of signalling in more generalist courses, we support the **development of links to employment and employment-relevant skills** in curriculum, project work, and efforts to **inform decision-making among students and employers**.
- In response to credential inflation in recruiters’ expectations, there could be **incentives for hiring less formally qualified people**, support for **hiring practices that emphasise demonstrable skills** over qualifications (e.g. education-blind hiring, trial periods, work tests), and perhaps even trials of **lottery-based hiring**.

Structural change

The issue of signalling should also prompt us to think more deeply about some of the structural features of our education system. Specifically, we should consider:

- **Reducing the time spent on testing to generate credentials** e.g. reducing the number of assessments or subjects at exam stages, particularly non-vocational GCSEs or A-Levels.
- **Dispersing the acquisition of signals away from the current crunch age of 18** as the driver of both A-level results and post-18 admissions for those hoping to attend university, e.g. with more granular degree classifications that are more comparable between institutions.
- **Reducing stratification in our education system** e.g. redistributing resources or reducing selectivity.
- **Developing more ways of demonstrating merit**, using a wider range of assessment strategies to test a broader range of skills and aptitudes, including the accreditation of skills gained through work or through self-study.

A better understanding of credential-based signalling

There should be investment in data collection and analysis to better map and measure signalling in our education system. This would allow us to refine our policy response, better understand where signalling is particularly prominent, and track whether signalling is rising or falling over time. This could involve:

- **Time-series econometric studies** comparing returns to education for different groups.
- **Regular surveys of (graduated) students and employers**, gauging their perceptions of the value of different qualifications.

- **Direct measures of ‘learning gain’**, that seek to measure directly the skills and knowledge developed by students.

Next steps

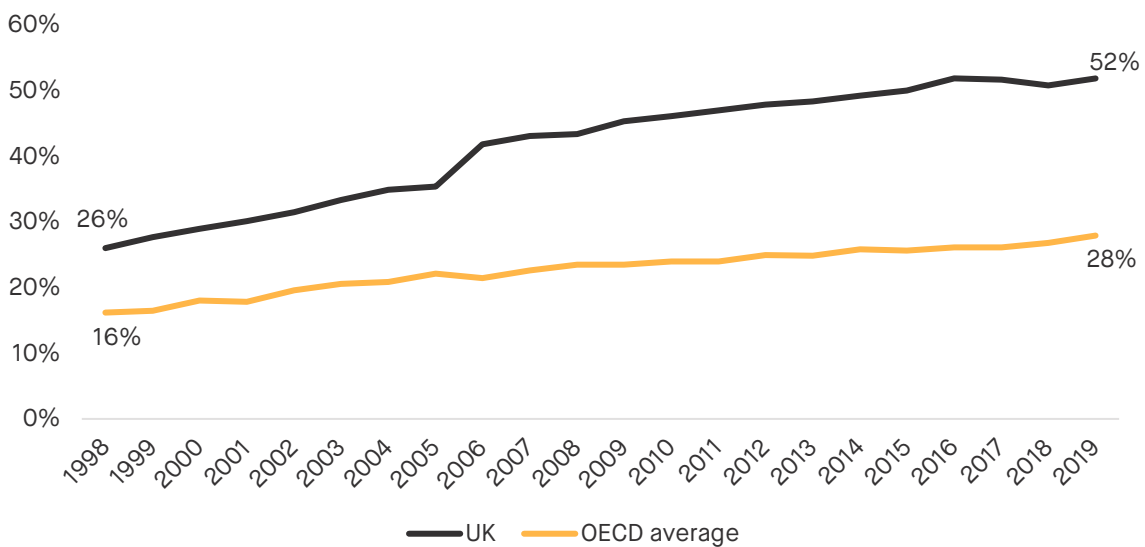
This paper represents a first tentative step in our efforts to grapple with the problem of how to mitigate the more wasteful aspects of signalling in the education system. As an immediate next step, **we would like to invite interested parties and experts to get in touch with the Social Market Foundation**, to help assemble a community of the willing to explore these topics, to understand what further we can learn from current data or practice, and to develop policy options.

CHAPTER ONE - INTRODUCTION

Is more education always better?

The last 150 years – and certainly the last half century – has been a period of ever-increasing levels of education. The school leaving age has been raised, more people have stayed voluntarily in education for longer, and universities and colleges have expanded. By way of illustration, the chart below shows the proportion of 25-34 year olds to have completed some form of tertiary education. In just the past 20 years in the UK, that figure has doubled, with around half of young people now achieving a further or higher educational qualification. Most other rich countries have seen similar trends.

Figure 1: Proportion of 18-24 year olds with tertiary education



Source: OECD (2021), *Population with tertiary education*

For the most part, this growth in education has been welcomed. Many people see learning as intrinsically good in itself.¹ Others attribute social benefits to it, helping people to understand one another better and participate in their communities.² The expansion of education is believed to have widened opportunities for social and economic advancement.³ And in the past 30 years, education has increasingly been credited as a motor of economic growth, the most reliable medium-term lever governments can pull to boost living standards.⁴

This paper focuses on the economic costs and benefits of education, without conceding the importance of its broader benefits. A focus on the productivity, career, and wage benefits of education aligns well with the motivations of university undergraduate students. Improving such prospects is often identified as a key reason for going to university; being the most important factor in a study of psychology students⁵ and a key consideration for students in a comparative study of students in the UK, Russia and South Africa⁶. Focus groups with 295 students in six European countries, including England, revealed three main motivations for attending university: preparing for the labour market, achieving personal growth and enrichment, and/or

contributing to societal development and progress.⁷ Labour market preparation was the most common motivation across the sample, especially in England.

At the same time, sceptics have questioned whether the ever increasing amounts of time and money ploughed into education have delivered on this promise, particularly with regard to higher education. Higher education spending is likely to come under further pressure in the coming years as governments are urged to redouble investment in primary and secondary education in particular to recover ‘lost learning’ due to the pandemic.⁸ It will be easier for the Treasury to support reallocation of funding within an education envelope than to find new money from elsewhere.

Education advocates more generally will continue to argue for education as central to plans to help workers re-skill amid social and technological change, with fears of the impact of automation on the job market.⁹ Such moves are bound to draw even greater scrutiny of the effectiveness and value of education – not least because of the vast sums of public money it involves. Total spending on education and training in the UK, including student loans, was around £100bn in 2019/20, just shy of 5% of GDP. Just under a fifth of that amount is higher education, including loans.¹⁰

Prior to the pandemic, the Institute of Fiscal Studies estimated that around one in five English university students would fail to recoup the cost of their degree in terms of higher earnings over the course of their careers. Only a quarter of those completing undergraduate degrees are expected to earn enough to repay their student loans in full, with the government subsidising the remainder.¹¹ Figures like these have led the think tank Onward to argue that much of higher education offers a poor “return on investment”.¹² The UK Government’s Master’s Degree Loan Scheme, which has been in place since 2016 and was accompanied by a 36% increase in student numbers in its first year, could in time bring similar objections.¹³

Or could it just be signalling?

There are a number of possible reasons for education scepticism – for example, the belief that current modes of teaching and learning are ineffective, that students are pursuing poorly-chosen subjects and courses, or that the students receiving educational opportunities are not the ones most likely to benefit from them. However, one of the most prominent in recent years is the belief that much of the education that occurs in our society is ‘signalling’, particularly in higher education – the focus of this paper.¹⁴

In the context of the job market and productivity, signalling occurs when a person benefits from an educational achievement, not because it changes them in any material way that increases their productivity, but because it reveals something about their pre-existing traits or skills. Even if the person is no different, the achievement allows them to demonstrate, prove or ‘signal’ something about themselves that was always true. This signal – provided it is hard to fake by those without the trait – can then be used as a filter for employers seeking to recruit for a particular set of traits or skills. Being hard to fake is key. Unless it is significantly easier for a person with the desired trait to acquire the signal, ‘cheaters’ will dominate and employers will cease to trust the signal, degrading its value.

For example, passing A-level English might signal, among other traits, that a person is a competent user of the language. Getting a place at Oxford or Cambridge University might reveal that a person is capable of impressing Oxbridge tutors sufficiently to win admission. Completing a PhD might provide evidence that a person can manage a long-term project. In each of these cases, the person may have had the desired ability long before they studied for the qualification, but the qualification makes that ability clear to the outside world.

Signalling theory challenges the standard ‘human capital’ theory of education: that education *improves* people, for instance, by transmitting knowledge and skills. On the human capital model, studying for A-level English makes people better communicators, studying at Oxbridge hones their intellectual abilities, and completing a PhD develops organisational and research skills. Learners come out the other end different and better to how they entered education.

There are different definitions of human capital and it is worth emphasising that we are adopting a broad interpretation of the human capital benefits of education to set in contrast to the concept of signalling. In principle, anything that genuinely makes a person more productive in a given role enhances their human capital, as opposed to creating signals which help a person gain access to a role but don’t improve their performance in it. Such productivity gains might come from social networks, useful experiences, soft skills, insights into themselves and their career suitability, as well as pure knowledge and skills. We might debate if there are cheaper ways to gain such networks, experiences, or insights, but they are still tangible benefits that can change a person and their productivity, rather than simply revealing an ability or trait they already had.

While discussions can sometimes treat enhancing human capital as ‘good’, and ‘mere’ signalling as ‘bad’, that is an oversimplification. Signalling – when it works effectively – generates information that employers would have to uncover through other means, which may be expensive and less accurate or fair – for example, each individual employer duplicating unreliable generic entry tests or potentially discriminatory interviews. Signalling effects may support better ‘matching’ between individuals and jobs, enhancing aggregate productivity across the economy and allowing appropriately capable people to access better paid and higher status positions, that better fit with their abilities, interest, and character.

That said, certain forms of signalling can have substantial downsides. Post-18 education requires students to commit several years of their life, take on thousands of pounds of debt and give up thousands of pounds in potential earnings by limiting their ability to do paid work while they study. The cost to government is typically thousands of pounds more per student. If that education is doing little to enhance the student, but is just uncovering their pre-existing features, this high resource and opportunity cost begins to look like a poor deal from a financial perspective and we might wonder what other approaches might be preferable.

Signalling also risks perpetuating social inequalities, sometimes serving as a proxy enabling employers to hire based in their own image or based on an ill-defined and ill-motivated sense of cultural match.¹⁵ This risk is exacerbated when employers do not think deeply about the specific, relevant human capital they are seeking in the people

they hire, when class backgrounds play a significant role in access to education, and when the signals in question provide particularly imperfect accounts of underlying ability. In other words, what is too often being signalled directly is a person's social background rather than their aptitude for the position in question.ⁱ

Worse still, investment in signalling can be almost entirely self-defeating from a societal perspective, even as it remains rational for individuals, leading to some recent commentators to call for “mutual educational disarmament”.¹⁶ This is because much of the value of signalling is ‘positional’, perhaps especially in the case of non-technical qualifications: the fact that a person achieved a qualification does not just tell us about them, but it also tells us something about their position relative to others. For example, completing an undergraduate degree identifies a person as one of the top x% of the population academically, and marks them out from the majority that did not go to university. This might help the person get into the top x% of jobs, but does little – under a signalling critique – to increase productivity in that role or increase the stock of such high-value jobs. If the signal had not been available, the employer might have had to work a little harder to find a suitably able candidate, but the level of job performance and output would have been much the same.

Higher education in the spotlight

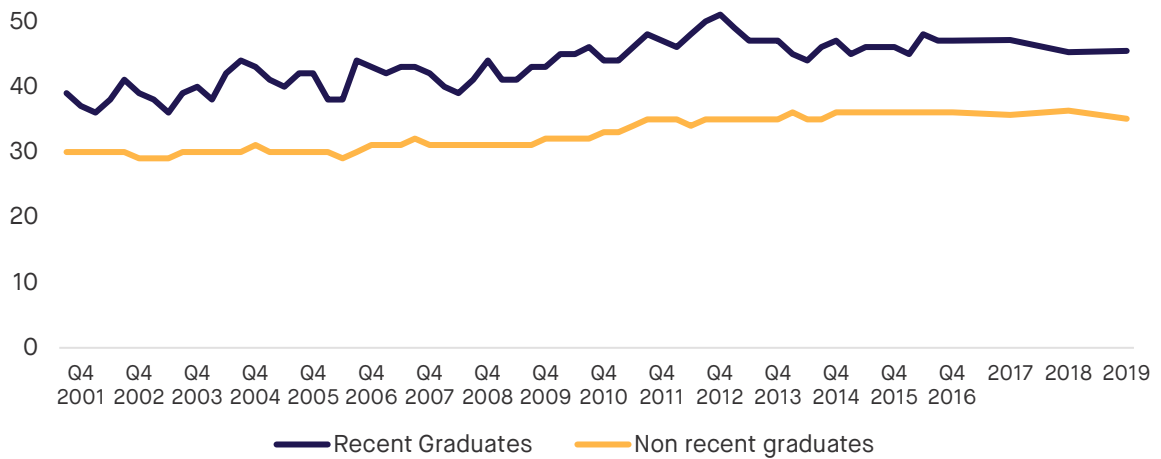
In theory, signalling can apply at all levels of education. Empirical assessments of signalling sometimes analyse the impact of “years of education” in general, rather than specific levels or qualification types (see chapter two). However, at the time of writing in England, the focus of the signalling critique is on higher education in universities. Such a focus is supported by the research evidence in chapter two, which suggests signalling may play a greater role in higher levels of education.

The critique in England links to concerns that the increase in student numbers shown in Figure 1 is leading to increases in graduates in non-graduate jobs, reductions in the wage premium associated with having a degree, and employers requiring degrees for roles as a convenient filter rather than because of the skill requirement in the role. These phenomena all hint at (but do not prove) an important role for signalling in the average career benefits of getting degrees, emphasising the wide variation in outcomes and influences around any average effect.

These concerns appear to be supported by statistics. The proportion of graduates in non-graduate jobs in the UK has gradually increased since 2001, albeit stabilising since 2017 (Figure 2). The rate for recent graduates, defined as leaving full-time education in the last five years, has increased from just below 40% to just under 50%, while the rate for all graduates has increased from about 30% to 35%. Defining “graduate jobs” is not straightforward, particularly in light of the education inflation phenomenon, but the definition used by the ONS in Figure 2 is broadly consistent over time, having been developed by the University of Warwick and the University of the West of England.

ⁱ The importance of behavioural social codes and fitting in, as well as the inability of education to be a compelling leveller of prior class divides, is discussed as part of the barriers to class equality in the UK by Sam Friedman and Daniel Laurison (2019) in *The Class Ceiling: Why It Pays to be Privileged*.

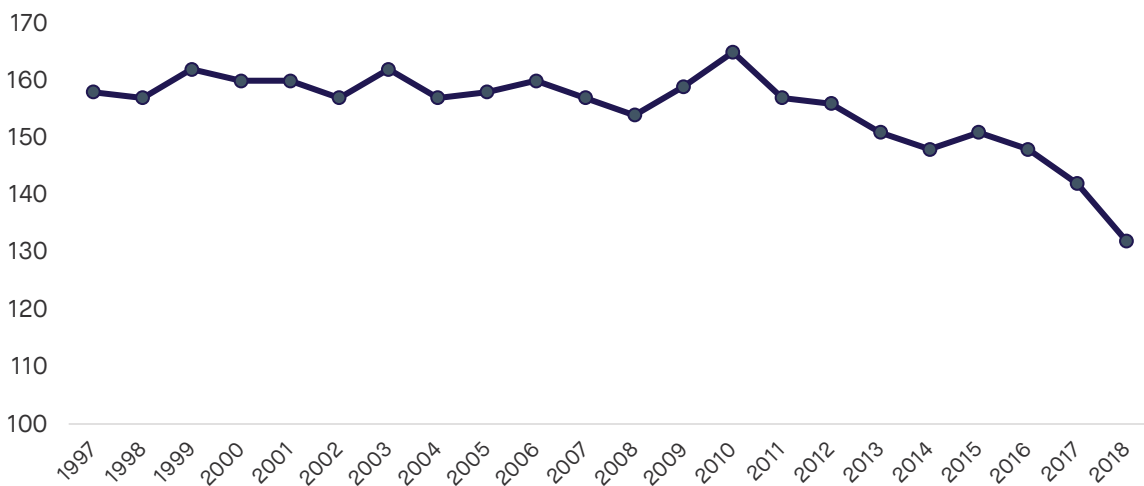
Figure 2: Proportion of graduates in non-graduate roles (UK)



Source: ONS

The second concern is the reduction in the wage premium associated with getting a degree. Descriptive data compiled by the OECD identifies a decline in the relative earnings among full-time workers with a Bachelor’s degree indexed against a worker with upper secondary education in the same year (Figure 3). In the late 1990s and early 2000s, those with a Bachelor’s degree in the UK typically received earnings about 60% more than those with upper secondary education. From 2013-2018, the average has been nearer 50%, with what looks like a sharp decline in 2017 and 2018 to nearer 30%-40%, although this should be monitored as more data becomes available to see if the sharp decline persists.

Figure 3: Relative employment earnings of workers with Bachelor’s or equivalent degrees indexed against upper secondary education at 100, UK



Source: OECD Education at a Glance relative earnings dataⁱⁱ

ⁱⁱ Note that different years use different inclusions of full-time and part-time workers, but always consistent in terms of the in-year comparison across levels of education (for instance 2014 and 2018 specify full-time full-year earnings, whereas 2015-2017 specify full & part time workers).

This descriptive data on a declining wage premium is supported by research evidence. Analysts using the large-scale Labour Force Survey in the UK have analysed four major birth cohorts who grew up in periods with very different levels of average higher education (HE) participation.¹⁷ Those born in 1933-46 were prior to the “Robbins expansion” in HE, which saw much higher participation for the next cohort born 1947-57. The third cohort examined saw an increase in the school leaving age from 15 to 16 and the settled higher level of HE uptake “post-Robbins” (born 1958-68). Finally, a cohort born in 1969-1977 experienced the 1990s increase in HE. While the analysis is limited, particularly in terms of the background characteristics it can control for, it is consistent across those four key birth cohorts. Examining the wage return for degrees relative to A-levels, the average return for women drops in each cohort, ultimately declining from 53% to 30%, with the most rapid drop taking place for those born in the 1970s; for men it drops in a similar fashion from 48% to 22%.ⁱⁱⁱ

A similar story is told by more sophisticated, one-off analyses that are less comparable over time. The Edge Foundation has observed government claims about the returns to higher education, typically drawing on such ad hoc analyses, have declined amid rising student concerns about value for money.¹⁸ In 2002, the UK Minister for Higher Education pointed to increased average lifetime earnings of some £400,000 from a degree. By 2017, the Universities Minister cited 2013 government-commissioned research that identified £250,000 for women and £170,000 for men.¹⁹ Research in 2017 by London Economics for Million+ placed lifetime benefits at just over £100,000. There are major methodological differences between these studies, but in all cases the stakeholders paying for and citing the research were incentivised to quote as large a figure as possible. The declining trend in what they feel able to claim should give some cause for caution.

The third concern is around ‘educational inflation’ and ‘credentialism’ – highlighted by the phenomenon of people needing to go to university to do jobs that previously required no such qualifications, postgraduate degrees for positions that previously only asked for undergraduate, and so on.²⁰ The evidence here is more controversial. For instance, the proportion of graduate nurses has increased in England and comparative analysis has suggested more highly qualified nurses are associated with reduced patient mortality – hinting at valuable human capital development.²¹ On the other hand, the UK’s professional HR body, the CIPD, has raised concern about certain occupations where the proportion of workers with a graduate qualification or higher increased from 8% in 1994 to 34% in 2007, arguing that this rapid generational shift cannot be explained entirely by changing productivity or technical requirements.²² Instead, the CIPD worries that recruiters are using degrees as a filtering device for general competence and maturity rather than working to specify the skills required for a role and recruiting accordingly. A similar phenomenon has been observed in the US,

ⁱⁱⁱ Despite presenting these results, the researchers conclude this is little evidence of signalling, because the fall in returns takes place across fairly evenly across the whole wage distributions, as opposed to being concentrated at the low end. However, an expansion of education credentialisation across the board, from more and better GCSEs, A-levels and degrees, is also consistent with lower returns across the wage distribution. For this reason, we present the researchers’ figures directly but disagree with their conclusions.

with researchers noting that in 2015, 67% of production supervisor job postings asked for a college degree, while only 16% of employed production supervisors had one.²³

The strongest evidence that credentialism has been taking place is employers starting to acknowledge it explicitly and react against it. In 2016, Penguin removed the standard requirement for its job applicants to have degrees.²⁴ In 2017 and 2019, Walmart and Amazon respectively launched schemes to upskill workers without degrees, intending to save money by not hiring university graduates instead.²⁵ The Institute of Student Employers in the UK has evidenced this trend through employer survey data from 2014 to 2018.²⁶ Such moves are effectively a recognition that their previous use of degrees as a hiring requirement was not justified by the additional human capital held by those applicants, whether because the role not does truly require it or because they can use recruitment processes to identify those abilities among a more diverse set of applicants without the need of degree certificates as a signal.

As higher education has expanded, the distinctiveness value of being a graduate has declined. As a signal alone, it is worth less to be able to say you are in the top half of the distribution than to say you are in the top quarter. To the extent that a desire to signal distinctiveness is motivating students, such devaluation can lead people to pursue additional qualifications that are more selective – for example, doing a master’s degree because fewer people hold them. But that merely encourages more people to take on those further qualifications, devaluing them in turn. The risk is that we inadvertently initiate a process of educational inflation where increasing amounts of time and money are poured into education for little aggregate benefit.

Where to next?

The signalling objection feeds into a broader political scepticism about the value of higher education. Some in government, channelling the attitudes of some of their voters, have qualms about the economic and social value of degrees, about the cultural effects of supposed liberal bias on campuses, and the level of academic standards (‘grade inflation’ and ‘dumbing down’ of curriculums).²⁷ Some of this may be overstated and in bad faith, driven by a desire to draw political dividing lines and prosecute a culture war. But that does not mean that the current system is beyond reproach, and it is counterproductive for the education sector to dig in, ignore the question of signalling, or assert that the status quo is optimal, i.e. that any signalling waste that might exist today is an inevitable and acceptable part of education.

In this paper, we take seriously the signalling critique of education, without conceding human capital theory as an important, even primary driver of the wage benefits of education. Given the possibility of signalling, we seek to understand what a rational, evidence-driven response could be. We want to know both how to develop indicators that might help track the extent and location of signalling and – where signalling does prove to be material – how we might retain the benefits of signalling with as little wasted effort and resources as possible.

CHAPTER TWO – WHAT DOES THE RESEARCH TELL US?

Chapter one introduced the idea that some portion of the economic value of education may come from helping individuals signal a pre-existing fact about their potential productivity, rather than by enhancing that productivity. To the extent this may be valuable to individuals and employers in reducing job matching costs, it remains a benefit that we might seek to obtain – but would nonetheless wish to do so at the lowest possible cost. We also suggested that signalling in the UK might be a more significant phenomenon in university education than basic skills education, given concerns about intake expansion amid non-graduate employment, a declining wage premium, and possible excessive credentialisation by some employers.

There is a fierce and longstanding empirical debate on *how much* of the value of education is signalling, which influences how much we should worry about it. The debate has tended to be concerned with whether signalling or human capital is the majority influence on wages. We have a different perspective on the debate: given the large costs and time commitments involved, even a modest proportion of signalling would be worth policy attention. If the benefits that are related to signalling can be gained at lower cost or shifted towards human capital improvements, there is more resource available for other public priorities

In this chapter, we review the empirical evidence on the scale of signalling. The research challenge is that decomposing the well-established wage gains associated with education into “signalling” benefits and “productivity” benefits proves very difficult. To simplify: in most situations the two theories make the same predictions: more education means more wages.

Econometricians have risen to the estimation challenge, devising ever more creative analyses and publishing hundreds of papers. They have researched those who just miss out on getting their degree certifications, the education decisions of the self-employed, hiring behaviour at Volvo, macroeconomic data, the Vietnam Draft, and the French riots of 1968, among many others. The technical language is arcane: Heckman selection modelling, regression discontinuity design, the Sheepskin Effect, exogeneous shocks as instrumental variables, structural general equilibrium model with endogenous education choices, and so on.

This murmur of academic output has not resulted in consensus. Indeed, it is easy to cherry pick dozens of detailed empirical studies that support a particular perspective. A meta-analysis of just one particular econometric technique in the signalling debate on just one stage of education (high school diplomas) found 24 analyses that rejected the presence of that particular form of signalling at the 5% level of statistical significance, alongside a further 98 analyses that did find evidence for it.²⁸ One economist, reflecting across a variety of studies, has claimed that signalling is the “majority” of the value of education, arguing that 80% is a reasonable estimate²⁹, whereas other scholars who specialise in education research have claimed the impact of signalling is “limited”³⁰.

In this chapter, we describe five of the main techniques used to estimate the relative contribution of signalling and human capital accumulation to gains from education, some example estimates they produce, and their main limitations. These five

techniques are the ones that have been used most consistently to arrive at a quantitative estimate of signalling, noting that other arguments have been made against human capital theory, such as how little students retain or apply after leaving education, student willingness to cheat (which contradicts a pure human capital model), and evidence from employer recruitment patterns. Our purpose is not to argue that these five techniques are above challenge; indeed we highlight certain limitations of each. However, if a diverse array of techniques identify a policy-relevant proportion of signalling, it is sufficient to motivate policy attention and shift the burden of proof onto those who might claim that signalling has a negligible role to play in the education wage premium.

Technique 1: Measure ability directly

The first technique we examine is the most seductive. If the main wage benefit of a certain advanced level of education is signalling the ability you had in the first place, then researchers should simply try to measure that prior ability directly. If people who are otherwise similar in terms of prior ability have different earnings in the labour market based on their education, that points towards human capital accumulation. The problem with this technique is that researchers quickly run into the same problem employers face – and the whole reason signals are so helpful. It is fiendishly hard to precisely define and measure the traits, attitudes, skills, connections, and competences that will make someone productive in a particular job without actually seeing them do the job for a decent period of time.

Longitudinal surveys have often been used to implement this technique. These surveys sometimes administer tests to people before they enter a certain stage of education, and examine how well those test scores explain any subsequent increase in wages. If those with higher prior ability see a greater boost in income, that would appear to suggest that the qualification has merely revealed that ability.

Such tests can never capture an individual's full potential productivity, which might imply they underestimate the signalling effect. Similarly, the regression analyses used are typically such that any covariation between ability and education influencing wages will be shared between them, rather than attributed solely to ability, which might further point to the technique being an underestimate.

More fundamentally, this technique has a major flaw: it assumes that people of all prior abilities benefit equally from education. But if those that did better on initial tests were also to get more out of their education, this approach would ascribe that gain in productivity to signalling. It is also complicated by evidence that people with the same qualifications can vary significantly in terms of actual skills, which employers may be able to discern in systematic ways that introduce error into the analysis.³¹

One example of such a longitudinal survey analysis in the UK tracked a cohort born in 1957, following their progress through education, into work, and through their lives, collecting rich data on their backgrounds. The survey administered tests of skills including prose literacy, document literacy and quantitative literacy. This dataset suggests that ability measured at age 7 explains about 16% of the wage return to years

of education for men; for women about 7%.^{iv} Using measures of ability at age 16, the researchers find 35%-45% of the wage return to education disappears once ability measures are included.³² Of course, education up to the age of 16 will have played a role in developing the skills measured in those ability tests, but the research nonetheless suggests that a significant proportion of the returns to education beyond the age of 16 is already reflected in ability known and established at age 16, subject to the caveats highlighted above.

Technique 2: Analyse the self-employed

A second technique invites us to look at a group of people who are argued to have little need of education credentials to signal their productivity to a recruiter – because they are self-employed and know their level of productivity first-hand. If the returns to education are lower among the self-employed than those signalling to an employer/recruiter, the difference would seem to reflect signalling over and above the average productivity gains from that education. One key limitation here is that the self-employed are different from employed workers in many structural ways that are not always adequately controlled for, and it is possible some of those factors might be driving any difference observed (e.g. industry concentration, attitude to risk, personal circumstances etc.).

A regression analysis using British Household Panel Survey data was used to compare self-employed workers and employees, suggesting that about 20% of the wage return appears to reflect signalling for men and about 25% for women.^v This technique is likely to result in an underestimate of the full role of signalling, since the signalling value of qualifications is not restricted to recruiters. Though the self-employed do not have bosses to impress, they still need to sell to their customers, sweet-talk their investors, creditors, and partners, and engage their subcontractors or staff. Education credentials as a proof of the self-employed individual's ability may help enhance their income through any of those social interactions.

Technique 3: The 'Sheepskin Effect'

The "sheepskin effect" (taking its name from the material diplomas were traditionally printed on) refers to the difference in outcomes between those who have a completed and certified qualification and those with that have the same amount of education without receiving the associated credential. If, for example, a person who studied for three years but dropped out just before completing their degree earns less than someone who got their diploma, it suggests that the certificate itself, as a signal, is conveying the additional value. Alternatively, researchers exploit the fact that different types of qualifications require different numbers of years to be obtained to see if there is something special about the year in which someone gets a certificate as opposed to any other year of education. By estimating the value of getting the certificate via either

^{iv} The researchers also controlled for parental background.

^v Using a Heckman selection approach with selection driven by housing equity and mother/father self-employment status. Controls include calendar year, marital status, children, region and regional unemployment.

of these methods, researchers hope to estimate what proportion of the value of the degree is due to signalling.

The implicit assumption behind this technique is that there is no difference in terms of human capital between people who study for the same length of time, but who do not all receive the same qualifications. Yet it is naïve to assume that all students receive the same value in terms of human capital from a year of education – receiving a diploma is stronger proof that a student has shown the requisite effort, dedication, and ability to complete the course and acquire the learning embedded within it. Not all units of education are equally valuable, and it is also plausible that the final elements may be particularly important in terms of developing useful skills. Indeed, some researchers have suggested that programme completers (diploma recipients) have higher cognitive skills than non-completers (not receiving their diploma) with the same years of education.³³ It is also possible that some students who drop out do so for complex, personal reasons that are unconnected to their underlying talents, but nonetheless impact how easily they can pursue and secure higher income employment.

Research methods only imperfectly adjust for these limitations. The basic technique is to compare wages for each number of years a person has been in education, noting when that number of years coincides with gaining a certificate. If each year is roughly equally valuable, they argue, you would not expect a major, consistent “bump” in earnings from those years that happen to generate a certificate. Another method is to look at those who dropped out of education just prior to gaining the formal final certificate, but can still demonstrate near-completion via interim transcripts and the like. If employers are keen on the level of human capital gained from an education process, examining a transcript that demonstrates 95% successful completion of all learning should result in only slightly lower levels of wages relative to a slightly more formal transcript that demonstrates 100% completion.

A meta-analysis in 2015 examined 122 estimates of the sheepskin effect for upper secondary education.³⁴ The researchers, drawing mainly on studies from Brazil, Colombia and the US, estimated an average wage premium associated with a high school diploma of 20%, but found this varied widely based on factors such as closeness to the tropics, gender, race and continent. The meta-analysis also identified a likely publication bias, in which studies that identified a larger, more statistically significant sheepskin effect were seemingly more likely to be published. Once the researchers adjusted for publication bias as far as possible, they identified a statistically significant 8% average wage premium.

For context, other researchers examining over 1,000 estimates of returns to schooling found around 7-8% average returns to each year of education.³⁵ This suggests, roughly, that the high school diploma as a certificate alone is worth around one extra year of education. With such diplomas typically reflecting two to four years of accrued education, that implies the sheepskin effect might be worth around 20% to 35%. Studies looking specifically at bachelor’s degrees tend to identify a larger effect, such as the 40%-60% derived from wage discontinuities in the US General Social Survey.³⁶ Considering the limitations described above, the sheepskin effect might be considered an indicative upper limit on signalling.

Technique 4: Natural experiments

Economists love to exploit data generated by a natural experiment (“exogeneous shock” or “policy variation”) to understand topics where randomised control trials would be impractical or too controversial. A strong natural experiment approximates random allocation to a treatment (in this case, additional education) in a way that is comparable to, if slightly less robust than, unblinded medical trials.

One of these natural experiments is the raising of the school leaving age from 15 to 16 in England and Wales in 1972/3 (RoSLA).³⁷ This caused a group of young people who otherwise would have left education to have at least one extra year of schooling by the random chance of being born a year later. Arguing that from that year to the next any other trends would be dominated by this major shift in policy, we can examine what happened to the students and learn about the impact of that extra year in school.

Researchers found that around an extra 15-20% of young people stayed in education the extra year and gained qualifications accordingly, but that there were no changes in A-level achievement either side of the policy change. This suggests that school students felt no need to get more qualifications at age 18 in order to signal differentiation from those suddenly now gaining qualifications at age 16. This points to a limited role for signalling in secondary education, but is also consistent with there being little labour market competition between age 16 and age 18+ education leavers or there being sufficient other means of signalling available.

Another analysis of compulsory school attendance ages focused on the US and exploited simultaneous variation between states. While US states are not closed economies and differ in structural ways that can only be imperfectly controlled for statistically, this simultaneity permits analysis of signalling better than a one-off change applied across a whole society. The study found that compulsory attendance laws increased enrolment in older age groups as well as the target group, consistent with the theory of signalling that higher ability students now need to acquire more years of education in order to stand out from the target group that would have otherwise left education sooner.³⁸

A different type of natural experiment took place in Universidad de los Andes in Columbia in 2006.³⁹ The university reduced the amount of coursework required to earn degrees in economics and business by 20% and 14%, respectively, but did not change the selection of incoming students: class size, prior attainment on high school exams and degree graduation rates were not affected by the reform. Wages were estimated to fall by approximately 16% in economics and 13% in business, pointing towards important human capital components of the degrees. If coursework volume proxies for the primary value in terms of relevant human capital accumulation, the wage reduction does not account for 20% and 7% respectively in the downscaling of the subjects, which points to a possible minority role for signalling.

Natural experiments often face limitations in interpretation. They identify the impact only on the small number of marginal participants affected by the event, i.e. for RoSLA the 15-20% drawn from the least educated who stayed an extra year. The effect is identified locally for that group and may not apply to other groups. Experiments often also relate to rare and specific sets of historical circumstances. It can be difficult to

know how far these results should be extrapolated to the present, given changes in context and circumstance. In this case, the labour market demand for youth employment in the UK has changed significantly since the 1970s and it is unclear whether those changes would lead to different conclusions on signalling.

Technique 5: The impact of scaling education

There is one area in which the predictions of signalling and human capital theories point in opposite directions: what happens when the overall level of education in a society increases. Human capital theory unambiguously argues for higher productivity and socioeconomic progress, subject to some limitations such as the restricted supply of other resources. Signalling theory argues that the ability to be productive was prior to the education and no new value is created, except for its contribution to reducing employer searching and recruitment costs. Provided this filtering value to employers is minor compared to the overall cost of education, we can test the signalling question by comparing wage returns to education both at the individual and the economy level.

Turning to macroeconomic data, we can estimate the effect of an additional year of national education on national income. If this is lower than the effects discussed before for a year of personal education on personal income, the difference may be driven by signalling or positional aspects of education that are beneficial to an individual but not to a society. Bryan Caplan cites various efforts to identify the national effect, ranging from slightly negative estimates to a few percentage points.⁴⁰ The strongest study analyses 21 OECD countries with eight measures of education and five separate research teams: the average comes out at an extra year of national education supporting 1% higher GDP.⁴¹ He also reports a high-impact outlier, with questionable methodology, that identifies a national return of 6-7%. With personal wage returns to a year of education averaging around 7-10%⁴² (typically higher in low income countries), even if the true national effect is nearer to the dubious outlier, signalling still reflects 20%-40% of the wage value - and it could be as high as 80% if compared to more typical studies.

The conceptual rationale behind this approach disentangling signalling from human capital is clear enough, but the empirical analysis and interpretation is anything but. Part of the challenge is that many other things change between birth decades besides higher education rates, and that many things vary between countries besides education levels. Careful regression analysis can only go so far in addressing these distinctions. For macroeconomic data there is a further issue: it may be that rich countries invest more in education (for many positive, pro-social reasons, as well as having greater ability afford them), rather than education investments being a major driver of the countries' wealth. With the effects and drivers of both growth and education dispersed and sporadic over time, the statistical challenge of perfect identification is almost impossible. However, this possible "reverse causation" of countries investing more in education as they grow richer for social, rather than economic reasons would lead to an underestimate of signalling via this technique.

Where does this leave us?

The debate continues to rage around whether education, particularly higher education, is *primarily* signalling/positioning or *primarily* productivity enhancing. For all its

academic interest, we believe resolving this question of primacy is of limited significance to policymakers.

Even if signalling only accounts for a modest share of differences in outcomes, we should be motivated to examine if it can be reduced. A modest share of a vast number can be substantial – and there is no other word but vast to describe the years of individual time, private contributions, institutional energy, and taxpayer investments into the higher levels of education. None of this necessarily argues against education as an important endeavour or argues against increasing education from its present level. But it does imply that we should seek to maximise the productive value we gain from education, while minimising any positional aspects as best we can.

Table 1: Estimated proportion of the wage benefits of education attributable to signalling – summary by technique

Technique	Indicative estimate	Possible bias
1. Measure ability directly	7%-45% of wage gain, higher end for post-16	Possible underestimate
2. Analyse the self-employed	20%-25% of wage gain	Likely underestimate
3. The “Sheepskin Effect”	20%-35% of wage gain (upper secondary) 40%-60% of wage gain (undergraduate)	Possible overestimate
4. Natural experiments	Negligible to material impact on education pathway decisions Up to 7%-20% of wage gain	Uncertain; but limited ability to extrapolate
5. Impact of scaling education	20%-80% of wage gain	Likely underestimate at low end

None of the five techniques described above - or the myriad papers drawing on them - are empirically or conceptually unassailable. Drawing on the indicative estimates in table 1 and reflecting on the limitations of each technique, we suggest that the signalling of prior ability (enabling relative positioning in the labour market) could conservatively account for between 20% and 40% of the average wage return of upper secondary or tertiary education in rich countries. It so happens that a previous UK government report concurred with this 20% to 40% estimate: the 1997 Dearing Report.⁴³ With the expansion of education since the late 1990s, any concern about signalling felt then should only be felt more strongly today.

The role of signalling could also be higher for non-vocational tertiary education, as some of the estimates look at consider years of education in general, conflating the basic skills honed in primary and lower secondary education (required for many jobs) with the more targeted education of later stages. As described above, estimates have tended to find higher signalling proportions for the later years of education. In any case, diversity of outcomes around those average estimates suggests that for at least some students and some career pathways, signalling is likely to be the primary value they gain from their course. These cases are then balanced out by courses which very

explicitly convey technical, vocational skills typically deployed by the majority of those graduates directly in a subsequent job (such as medicine, architecture, finance, or data science). Some roles also require certain levels of certification as part of licensing requirements, although it is hard to disentangle where such requirements reflect technical necessities for safe and high-performing practice as opposed to gate-keeping, brand building, or convenient filtering.

For all the thoughtful empirical and theoretical arguments debating the presence and scale of signalling effects, there is little literature on what we might do about it beyond the occasional bombastic proposal for ‘educational austerity’.⁴⁴ It is this topic we turn to later in our report. How can we identify when and where signalling of prior ability is a particularly prominent aspect in an education pathway? And where it is prominent, how can we keep the socially useful signalling process at lower total social cost? Before that, though, we consider why education sector advocates should even engage with this debate.

CHAPTER THREE – SHOULD EDUCATION ADVOCATES ENGAGE?

Recent decades have been relatively good for higher education in England, in terms of student numbers at least. The policy environment in the years ahead may not be so benign. At least since the Office for National Statistics reclassified student loans unlikely to be repaid as government spending, adding £12 billion to the deficit overnight⁴⁵, the Treasury has bridled at the growing cost of higher education. The pressure put on the public finances by the pandemic is unlikely to make them any more favourable to the expenditure. Even within education, there are strong demands for ‘catch up’ spending on school-age education to make up disrupted learning during the pandemic and for greater investment in (relatively cheaper) further education, which has been relatively neglected in recent years. Moreover, with the number of 18 year olds set to increase over the next decade, merely maintaining current participation rates would require the government to fund 40,000 more student places in England by 2035.⁴⁶

At the same time, the political environment is increasingly challenging, if not hostile, for the higher education sector. While the ‘culture war’ is far less heated in the UK than the US, there are some concerns, particularly on the right, about the values of universities and their commitment to free speech.⁴⁷ More bluntly, as Rachel Wolf has put it, there is the view that “the government is paying for ever-more academics that loathe them and attack on principle”.⁴⁸ With graduates considerably less likely to vote Conservative, reducing student numbers may seem political expedient, too.⁴⁹

There are indications that the process is already underway. Student number controls were reintroduced at an institutional level as a temporary measure during the pandemic, and while they may not be retained, there is a sense of a Rubicon having been crossed. There are strong hints that the government is looking at clamping down on particular courses or reducing student numbers by introducing minimum entry requirements.⁵⁰ University leaders are reportedly bracing for substantial cuts.⁵¹

Signalling theory is likely to form a central part of the case for reducing educational expenditure, explicitly or implicitly. Cutbacks are much easier to justify, internally and externally, if they are perceived to reduce ‘wasteful’ and ‘unnecessary’ studying than if they involve denying people socially beneficial learning. In that context, the prominence given to works like Bryan Caplan’s *The Case Against Education* – which argues that most of the value generated from education comes from signalling – will only strengthen the hand of those that want to impose educational austerity.⁵²

Thus far, the response of educationalists has generally been to resist the notion that signalling is a significant portion of the value of educational qualifications, or at least to minimise its importance. In our view, such a response underplays the evidence for signalling playing at least a meaningful, if minority role in the productivity outcomes of education, as we have described it above. But it is also likely to be politically counterproductive – refusing to acknowledge what people and politicians believe they see in the world around them is likely to undermine credibility.

We believe a more powerful and effective response is to recognise that signalling is an issue, that it is often undesirable, and that we do not fully understand when and where it occurs. Granting that, and seeking to identify and mitigate the forms of signalling

that are not social beneficial, would not just be politically prudent – it would also be good policy, saving time, energy, and money to be better used elsewhere.

CHAPTER FOUR – HOW SHOULD WE RESPOND?

So what might we do about this?

Attempting conclusively to disentangle signalling from human capital development is an academic exercise – one unlikely to achieve consensus any time soon. Given the costs to individuals, society and the economy from signalling, it seems inappropriate to wait for the academics to sort out their disagreements. If we can accept signalling occurs to a non-trivial extent, we should get on with the practical task of trying to mitigate its avoidable costs.

This will be far from straightforward. A range of stakeholders – students and parents, educators, employers and policymakers – have all contributed to the system of educational signalling that has developed, and they all have a role to play in reducing it. In the case of students and parents, we have to recognise that signalling is often individually rational even if it is socially wasteful, and it is unreasonable to expect them to disadvantage themselves by forgoing qualifications that signal their ability – but their criticism of the system and a willingness to explore alternatives will be essential to making progress.

The onus for change is more on those that set the ‘rules of the game’ to alter them and ensure that real human capital development pays more than signalling and that learners can make informed choices about how best to develop their skills. Educators, assisted by researchers, should do more to monitor and improve the effectiveness of their teaching and assessment practices in building human capital. Employers should ensure that their hiring practices reward human capital and do not incentivise the acquisition of signals and the inflationary process that often follows. And policymakers need to think carefully about how they allocate resources and regulate education. There is also an important role for researchers in helping us to better understand signalling and how it is evolving over time.

In this section, we consider three (complementary) approaches to reducing wasteful signalling in our education. First, risk mitigation – identifying ‘risk factors’ that make signalling more likely and taking steps to counteract them. Second, deeper structural changes – reviewing assessment, funding and hiring practices more fundamentally to determine how they might be reformed to limit the incentive for signalling. Third, improving our understanding of signalling – embarking on a pragmatic and policy-focused research programme using different methods to quantify and track signalling in different parts of the education system.

Risk mitigation

One constructive starting point is thinking about the ‘risk factors’ that might make a particular student or a particular educational credential more likely to have a significant signalling component. For each risk factor, we can consider which policy options might provide some protection. In the sections that follow, we sketch out (somewhat speculatively) what some of those risk factors and mitigations might be, as part of sparking a broader conversation. To be clear, many of these are hypotheses and suppositions to be tested rather than clearly demonstrated phenomena – at this stage all we are seeking to do is to ask the right sort of questions, not provide a fully worked

out answer. We start with pragmatic strategies that could mitigate costs in the current system, before considering the potential for structural changes.

Excessively costly signalling, sunk costs and drop-out aversion

In cases where signalling is a major component of a course, the length or lack of flexibility in such courses exacerbates the cost of signalling. For example, if all a person needs to signal is that they meet the entry requirements of a university, or that they are capable of producing university standard work, they may be able to prove that within a few weeks or months of enrolment. Yet the typical undergraduate degree is three or four years long, so it may not be the best use of time and resources for such students to complete their degrees.

Similarly, those students that have already started their course may feel discouraged from dropping out or even changing to a different course for fear of sending a negative signal. This can give rise to ‘sunk cost’ thinking, with students unable or unwilling to take advantage of the things they have learned about themselves and their studies. Concerningly, recent evidence from UCAS suggests that 40% of young people are making poor qualification pathway decisions that they later regret.⁵³

In response, policymakers could seek to encourage modularisation of courses, with modules serving as credentials in their own right, and flexibly assembled into larger, commonly-recognised certificates. This would make it easier for students to ‘hop on’ and ‘hop off’ education, rather than being stuck on courses for longer than is valuable. It may also be effective to see common qualifications that are shorter and more varied in length, moving away from orthodoxy that all degrees should take a standard length of time. As well as shifting expectations around teaching, it should be easier for students to sit final exams if they are ready to pass them. Moreover, we should be seeking ways to make it easier for students to try out different courses, change courses, supplement gaps in prior qualifications to qualify for a new course and make it easier to resit return to subjects later in life. With users of education often understandably conservative about system reforms, any such changes would need significant promotion and explanation in order to build awareness, trust, and changes in behaviour.

Encouragingly, the Government in England appears to share these ambitions. In a speech in May, then Education Secretary Gavin Williamson acknowledged that “Our student finance system currently favours and pushes people towards a three-year full-time degree at the expense of lifelong and higher technical learning. But most people need more flexibility in their lives to study, to train or retrain and upskill as both their circumstances and the economy change”.⁵⁴ The Post-16 Education and Skills Bill, currently making its way through parliament, is supposed to go some way towards realising that vision. Adult education is at least receiving some of the attention it deserves with the Lifelong Loan Entitlement (and not before time, following a decade of funding cuts).⁵⁵ The recent *Skills for Jobs* White Paper committed to exploring credit transfer between institutions and courses.⁵⁶ This is all easier said than done. The practicalities – defining modules, validating, and regulating them – are forbidding.⁵⁷ But we at least appear to be moving in the right direction.

Default pathism

We might expect signalling to be more likely when learners take certain educational pathways primarily because they are following those around them and/or they feel deviating from the typical path will reduce their attractiveness to future employers. Doing university as the “obvious next step” and not questioning the broader purpose or value of going to university is a common theme in qualitative research exploring the decision to enter higher education.⁵⁸ By contrast, human capital formation seems more likely where options are proactively and deliberately chosen, based on the student’s personal attributes and ambitions.

Consequently, we might hope that investment in more and better career guidance^{vi} support for 14-18 year olds could help produce more informed and proactive educational choices and thus reduce wasteful signalling. Greater exposure to employers could also help young people to better understand themselves and their goals, giving them a better chance of getting the most out of their education. Thus, increased support for young people taking on paid work or work experience alongside their studies could improve their understanding of their preferences and the labour market. Helping young people identify multiple careers of interest can also reduce the influence of a default path, by introducing more personal deliberation into planning. Such an approach can include identifying stretch options that might be very competitive, high risk, or hard to access given their grades, as well as backup options and a working plan for taking steps to ensure backup options remain open and specifying how much time to devote to pursuing stretch options before reassessing.

Making it easier for people to take breaks in their education could also provide some useful disruption to their learning trajectories, giving them an opportunity to pause and reflect and more consciously consider the path that they are on, and whether it is right for them or whether they are merely “following the herd”. Gap years, years in industry and time spent in volunteering programmes (possibly as a requirement for access to student loans for undergraduate admissions) could provide opportunities for such breaks. They would also have the benefit of putting learners in a slightly different environment, where they may not be so influenced by their peers.

Youth and lack of experience

There are various reasons to think the education and training pursued by later learners might be less susceptible to wasteful signalling – and that we should therefore prioritise investment in adult education. To begin with, we would hope that older people can approach career and educational decisions with more maturity and self-awareness. Removed from the ‘conveyor belt’ that carries students from secondary to higher education and more insulated from peer influence, we would probably expect adult learners to be less subject to the ‘default pathism’ described in the previous section. Older people are also more likely to have experience and understanding of the labour market and the skills they need to progress within it. That workplace experience further means that mature students are less reliant on educational signalling to mark

^{vi} With career guidance defined broadly, e.g. including all the activities encompassed in the eight Gatsby Benchmarks

them out – educational credentials are likely to play a much more prominent role in recruitment for graduate roles as compared to experienced hires.

None of which is to say that older learners are immune to signalling. Many employers that hire them will still be moved by credential-based signalling (consider, for example, the value placed on MBAs). However, it does seem plausible that mature students are more likely to be motivated to develop skills and knowledge that they know from experience will benefit them in their careers.

That implies that older learners should comprise a greater share of people studying at any one time. Yet in recent years spending on adult education has halved, and participation dropped by a third.⁵⁹ Reversing those trends could help reduce the total avoidable costs as driven by signalling.

Courses with fewer default sector links

All courses have the potential to support students develop their human capital and deploy it in satisfying careers, whether via the development of underpinning or transferrable skills such as research, critical thinking and group work, or via skills for direct deployment at work, such as IT, accounting, medicine, or engineering. For some courses, this potential is particularly clear: courses that target certain occupations (which might have certification requirements for particular roles), courses that have links with employers to ensure content is relevant to employment, or courses that supports work experience, projects, internships or other activities that build connections directly with employers. However, courses will vary in the extent to which these links are straightforward by default or invested in and taken seriously by the institution. And with students having a range of motivations, there will always be space for courses which deliberately have little direct link to the labour market beyond ongoing study and academic research.

In a labour market like the UK's, with many graduate roles having flexible entry requirements with respect to subject studied (unlike, for instance, France or Germany), there is freer choice about subject of study – but more emphasis on the institution studied at, the work experience and extra-curricular activities participated in, and the students' personal and family networks. This flexible environment can allow courses to flourish with fewer default sector links, even among students who would like the course to help them access good employment, supported by an optimistic, occasionally misleading narrative that students can “study whatever subject they want and still get almost any graduate job they might want”. Courses with fewer default sector links are a risk factor for courses where any wage benefit might be driven more by signalling than average.

Courses with fewer sector links might be the focus of policies aimed to reduce signalling in a range of ways. For instance, support and subsidy might be provided for such courses to understand and foster links to particular sectors (which can take a diversity of forms as noted above), effectively drawing out and demonstrating their human capital contributions. Pressure for change might be fostered through greater awareness among students and employers of the specific knowledge, sector links and abilities coached through a course, potentially raising demand for courses that provide more of this type of value (as the “employability” discourse has promoted in recent

years) – or at least supporting informed, explicit decision-making among those preferring less sector-related subjects. Courses which choose not to engage in such a process over a significant period of time (or which fail to make sufficient progress) might place at risk some proportion of a taxpayer subsidy, just as with institutions who fail to deliver on widening access requirements and with school-age qualifications that fail to show benefits for their learners.

Credential inflation by recruiters

As described above, there are many jobs that in the past required a lower level credentials. It is likely that not all of these have changed sufficiently to motivate that inflation, but instead recruiters use credentials to narrow down fields of applicants. In such cases, signalling is clearly wasteful, delaying the start of people’s careers without significantly improving their ability to perform their roles. It is hard to identify with any great confidence where such inflation occurs. However, we might expect person specifications that ask for specific skills and knowledge (e.g. a chemistry degree; training in statistical modelling) to be less likely to fall into such patterns than job searches that favour applicants with a certain qualification level or institutional background (e.g. any undergraduate degree; preference for graduates of Russell Group universities).

In response, employers might be encouraged to hire people with fewer formal qualifications and to help them to develop their skills on the job – the apprenticeship levy could be seen as an example of a policy that attempts to do just that. A shift in cultural norms supported by the cost saving potential might be enough to drive this behaviour. We might also promote hiring practices that push against credential inflation and seek to improve diversity. For example, we should celebrate organisations (like the SMF!) that implement institution-blind hiring, requesting applicants not to disclose where they studied. We could push the principle further and encourage experiments with subject-blind and qualification-blind hiring. More use could be made of work trials and job-related tests that evaluate applicants’ skills and fit for the job directly, rather than relying on information about their background. Encouragingly, there is some evidence that employers’ reliance on qualifications is indeed declining.⁶⁰ More broadly, we could attempt to track credentialisation, and how it develops over time, in different industries, to help call out industries that are contributing to this social waste, while celebrating those who act to reduce it.

More radically, we might question whether this level of discrimination and selectivity is really effective – is trying to make fine-grained distinctions to find the very best candidate from a field of people that could all do the job adequately worth it? For example, it may be worth experimenting with the use of lotteries to select an applicant from all those that reach a certain threshold of demonstrated skill or experience.

Table 2: Summary of risk mitigation policies

Potential risk factor for signalling	Potential policy responses	Immediate feasibility
Excessively costly signalling, sunk costs and drop-out aversion	Modularisation Courses that are shorter and more varied in length	Medium
	More opportunities for students to try out other courses, change courses, supplement gaps in prior qualifications to qualify for a new course	High
Default pathism	Investment in career guidance	High
	Greater support for undertaking paid work during secondary education	Medium
	More breaks in education (gap years, industry years, volunteering programmes, potentially as a requirement for access to undergraduate student loans)	Medium
Youth and lack of experience	Investment in adult education	High (but expensive)
Courses with fewer default sector links	Support courses to develop links to employment and employment-relevant skills via curriculum, project work, or activities; support awareness and informed decision-making among students and employers; apply pressure via taxpayer subsidy (similar to widening access requirements)	Medium
Credential inflation by recruiters	Incentivise hiring of people with less formal qualifications and training them on the job	Medium
	Support hiring practice that emphasise demonstrable skills, rather than qualifications e.g. education-blind hiring, trial periods, work tests	Medium
	Track credentialisation by industry	High
	Trial lottery-based hiring among all candidates above a set threshold.	Low

Structural change

Risk mitigation strategies are, by design, focused on maintaining elements of the current system, but helping individuals and employers to navigate it at lower cost and reducing the chances of a wasteful qualifications arms-race. However, the challenge of addressing signalling should also prompt us to think about the fundamental structures of our education system and economy, and how they might be improved.

The human capital element of education can be naturally enhanced by reducing the time given to testing to generate credentials (as opposed to testing used pedagogically to support learning or to evaluate educational effectiveness). Reduced credential testing can be achieved through reform at various levels of the system: caps to the number of qualifications publicly-tested (e.g. fewer GCSEs or fewer A-levels taken by default), fewer points of testing (e.g. remove GCSEs in all but functional skills), testing narrower material, or shortening the length of courses and material covered.

Credentials already only measure a fraction of the knowledge we learn, so further reducing this fraction should not be seen as a concern in its own right, i.e. it is a decision of appropriate degree rather than a qualitative or binary preference. From a signalling perspective, what likely matters is the ability of a test to differentiate, which can be done nearly as well on a short test as a long one, provided the questions have an appropriate span of difficulty and everyone has equal time to “cram” for them. Advocates of human capital should also welcome the increased availability of curriculum time to support learning.

The problem of signalling should further encourage us to look at the equity of our credentials system. For instance, the two of the most significant education-based signals are acquired at 18: A-levels and university admission. This puts significant pressure on a single year of education, disadvantaging individuals who experience disruption in that year or develop at different rates. Dispersing the acquisition of signals over time may help. One way to do this would be to build greater trust in the discrimination, reliability, and comparability of degree classifications – by standardising some assessments across institutions, or by introducing greater differentiation in graduation grades. Such measures would put more emphasis on signals acquired between age 18/19 and 21/22 relative to the status quo.

It is worth noticing that institutionally-stratified education systems risk exacerbating signalling, by placing emphasis more on admissions and institution name than on what is subsequently learned at that institution. This is particularly important in the UK where degree completion and grades do little to differentiate candidates: drop-out is very low in the UK compared to other countries^{vii} and 79% get a 2:1 or higher.^{viii} Taking steps to reduce some of the differences in status between more or less prestigious institutions – for example, by redistributing resources, or by promoting more “comprehensive” and less selective intakes – could help reduce inequality and the power of signalling.⁶¹

^{vii} The UK has a higher completion rate for the original duration of a Bachelor’s degree plus three years than all other OECD countries: 85% compared with the OECD average of 67%. See Hillman, N. (2021), *A short guide to non-continuation in UK universities*, HEPI Policy Note 28.

^{viii} The proportion of UK-domiciled, full-time first degree graduates attaining a first class honours degree from an English higher education provider has increased from 16 per cent in 2010-11 to 30 per cent in 2018-19. For the same graduate population, the proportion attaining a first or an upper second class degree has increased from 67 per cent in 2010-11 to 79 per cent in 2018-19. For more details see OfS. (2020). *Analysis of degree classifications over time: Changes in graduate attainment from 2010-11 to 2018-19*.

A more profound systemic change would seek to develop more ways of demonstrating merit, differentiating ability across more of its many facets that enable individuals to contribute in different ways to a complex, diverse economy. For instance, credentials and signals might be split explicitly across domains such as information recall, pattern recognition/extrapolation, creativity, social intelligence, and so on, reflecting the principles of adaptive intelligence and recognising many subjects require strengths across multiple domains.⁶² Some of these domains may be well-measured through time-trial exams, others through open book, coursework, personal portfolios, extracurricular activities, industry projects, or team-based initiatives.

Finally, discussions of signalling should recognise that the education system does not exist in a vacuum or simply ‘prior’ to the wider economy or the labour market. In fact, developments in education reflect this wider context. In particular, a high level of signalling can be taken to be a symptom of a number of issues in our economic model. If inequality is high, if the economy is stagnant, if levels of (graduate) employment are lower, there is likely to be fiercer competition for the most rewarding and desirable positions, and more need for signals. By contrast, if economic growth is strong and improvements in workers’ circumstances are widely shared, that pressure is weakened and the waste due to signalling might fall – or at least become less policy-relevant. In this sense, a high level of signalling can be seen as a measure of the failure to provide enough good jobs for all.

Table 3: Summary of structural change measures

Measure	Immediate feasibility
Reduce testing to generate credentials	Medium
Increase signalling value of higher education qualifications	Medium
Reduce stratification between educational institutions	Low
Develop more differentiated ways of demonstrating merit	Low
Improve labour market conditions to weaken competition for desirable jobs	Low

A better understanding of credential-based signalling

For policies to be at their most effective, they need to be targeted to where the problems are greatest and it needs to be possible to track progress over time. Conclusive proof of an exact mix of signalling or human capital development in qualifications might be unattainable, at least with current levels of academic understanding, but there are measures and data collection investments that could provide pragmatic tools to guide policy.

A key question is whether the signalling component of education is increasing or decreasing over time. Provided a consistent measurement technique is used, and being mindful of structural breaks in the labour market, some of the econometric methods discussed earlier could be reviewed regularly and treated as a time series, monitored and published systematically by government. For instance, analysis of the returns to qualifications for self-employed compared to the employed can be repeated every few years using publicly available datasets – and with large enough samples the

frequency can be increased and/or the analysis can be broken down by type of qualification.

Returns to qualifications can be investigated more generally, drawing on large administrative datasets like Longitudinal Education Outcomes, and compared against the changing prevalence of those qualifications in the labour market. ‘Low quality’ courses, which employers do not value either for the signalling quality or for the learning they demonstrate, should also be scrutinised, continuing the work set out by Professor Wolf in 2011⁶³ – recognising the difficulty in measuring different forms of quality⁶⁴ and the political debate around whether some types of educational outcomes are more deserving of taxpayer subsidy than others (e.g. improved earnings/tax payment, channelling students into skill shortage areas or key public sector roles, or broader wellbeing and community cohesion benefits).

More immediate indicators that provide trend tracking for shorter-term policy changes (rather than the time-lagged econometric measures of signalling) could be developed by asking students and employers directly about the value of qualifications. Such questions could be embedded in existing survey instruments, such as the National Student Survey for current students or the Graduate Outcomes Survey for 18 months post-graduation, as well as longer-term surveys on a sample basis to capture insights that only become clear with hindsight and greater career experience. Opinion-based measures come with their own flaws, but can be calibrated and triangulated against other, more robust forms of research to inform their interpretation.

We would also do well to reinvigorate efforts to measure “learning gain”, which would give us a clearer idea of the skills and knowledge (i.e. human capital) that students are developing in the course of their studies – and thus offer more grounds for confidence that they are receiving non-signalling benefits. The OECD’s plans for a “PISA for Higher Education”, enabling comparison between countries and between institutions on the basis of standardised tests, seem to have been shelved.⁶⁵ Moreover, the Office for Students is apparently “taking stock” of the findings of a project to explore measures of learning gain from the UK – though without much evident urgency.⁶⁶ It is a challenging exercise to get right conceptually, but perhaps there can still be value in an imperfect test; after all, many important policy issues can only be measured noisily and indirectly – social cohesion and inflation for two – and yet we still do our best to measure them and usefully draw on the insights to inform policy.

Table 4: Summary of better tracking and measurement approaches

Measure	Immediate feasibility
Time-series econometric studies comparing returns to education for different groups	High
Regular surveys of (graduated) students and employers, gauging their perceptions of the value of different qualifications.	High
Direct measures of ‘learning gain’ that seek to measure directly the skills and knowledge developed by students.	Medium

CHAPTER FIVE – NEXT STEPS

We do not think there is a single, obvious policy solution to the current challenges that education faces when confronted with the signalling critique. In the previous section, we discussed a range of possible ideas both to gain a better grasp on the extent of signalling and where it is most prevalent, and to give young people and employers more individual freedom to exit the signalling arms race or to signal their underlying abilities at lower cost. These ideas are not the only ones and would, in any case, need development and prioritisation before identifying a strong platform for decision-making. As with all policy ideas, it is important to be sensitive to the appetite for change and the risks of knock-on consequences of large-scale reforms.

As an immediate next step, **we would like to invite interested parties and experts to get in touch with the Social Market Foundation**, to help assemble a community of the willing to explore these topics, to understand what further we can learn from current data or practice, and to develop policy options.

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