

Degrees versus Skills: Are Universities Preparing Graduates for Real Work, or Just Credentials?

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Abstract

It is now a staple in public discourse that universities do not create jobs but rather credentials, and that this is typically argued against as if it were a single empirical question, with a single answer. The question is poorly formulated, this paper contends. A degree serves at least four functions: it creates a capability, it provides an indicator of existing capability, it conveys behavioural predispositions, it allocates access to a position on a queue. They benefit different people, have different decay properties, have different welfare implications, and, due to their empirical entanglement, evidence produced to support one is often interpreted as evidence against the other. We devise the Credential Function Decomposition (CFD) framework to decompose them, and we define credential drift as the difference between the allocative weight that employers give to a degree and the capability content of that degree. There are four observable mechanisms that can drive drift, of which opportunistic upskilling in slack labour markets is best documented and most challenging to align with the pure human-capital account. We then argue that the solutions of universities' training in job-ready skills is misdirected, since the skills with the shortest half-lives are the ones that are the least in the universities' comparative advantage and the ones where employers have historically paid the training price. Comparative evidence from vocational education systems, in which the early employment advantage is smaller and can even turn into a disadvantage at the older age, supports this reading. We also cite the need for an independent, valid assessment as the "stick" that makes a change from credential-based screening difficult, if not impossible, and describe it as a public good problem that has been seemingly unsolvable by the private sector. Seven propositions are drawn from this, as well as a reflection on the skills-based hiring movement, which to date has far outnumbered actual hiring behaviours. This paper does not gather data for the estimation of the parameters; hence no invented statistics are reported here, only an estimation template with placeholders to be filled with a transparent simulation harness.

Keywords: higher education; human capital; signalling; credentialism; graduate employability; skills mismatch; skills-based hiring; curriculum design

1. Introduction

Perhaps no single statement is as widely accepted in the popular press as it is generally rejected in the scholarly research literature: Universities are failing to equip graduates for work. Employers state that graduates are not equipped with necessary skills. The graduates indicate that their academic programs had little to do with their careers. The reaction from policymakers is to push institutions in the direction of measures of employability, work-integrated learning, and curricula that are aligned to industry. The answer to this implicit theory is simple: universities are issuing certificates when they ought to be issuing competences and the cure is to become more vocational.

This is not as simple as it sounds; the research literature does not support it, nor does it support the other one. On average, estimates of the causal return to education based on compulsory-schooling variation tend to provide large earnings effects, which bear out on the face of them genuine capability formation (Angrist & Krueger, 1991; Card, 1999; Oreopoulos, 2006). The sheepskin effect, evidence of discontinuous returns at the point of certification, is just as well documented and hard to explain using a strictly productivity-based approach (Hungerford & Solon, 1987; Jaeger & Page, 1996). More recent research, however, with more precise identification has led to mixed results for some certification systems (Clark & Martorell, 2014; Tyler et al., 2000), where some found it to be a poor signal and others found it to be a good signal. A body of evidence has emerged over the past 50 years, and a debate that periodically resumes from first principles (Weiss, 1995), neither of which can claim to be that of the human capital approach, nor that of the signalling approach.

This paper's thesis is that the impasse is due to the question not to the evidence. The question of whether a degree is an indicator of skills or skills actually leads to suggests that these are alternate ways of explaining one function. They are more commonly seen as two concurrent functions that might be simultaneously performed by a credential, for different individuals, for differing persistence, and so on. After their separation, there appear to be several conflicting pieces of data, and the policy question takes a different form. It stops being an issue of whether universities should teach more skills, and turns into an issue of which functions we're asking the credential to serve, whether or not they're doing them, and what occurs when the load that employers place on this credential differs from what it actually contains. We call that credential drift when it comes to the divergence. Drift is not synonymous with credential inflation, which refers to the increased qualification levels needed for a specific job, but is rather the gap between allocative weight and capability content of a job, one of the many observable expressions of which is credential inflation. Drift is important because it causes three separate and distinct harms that are generally considered separately: it deprives qualified non-graduates of opportunities to work in jobs they are capable of doing; it forces employers to assume the risk and cost of screening; and it reduces the value of the credential as more and more people obtain it.

The second argument of the paper is about the remedy. To solve the problem of drift, to require more "job-ready" skills from universities is a solution to another problem, and perhaps a counterproductive one. Research on skill returns suggests that certain technical skills lose their value quickly whereas other domain-general and social skills do not, and that much of the early-career earnings premium of technical skills becomes obsolete as the specific content becomes outdated (Deming, 2017; Deming & Noray, 2020). If so, the most perishable layer is exactly the one which universities are least able to provide, and which employers are most able to provide; and forcing institutions to specialise in this involves sustainable capabilities for short-lived capabilities, with the university losing and the student gaining. Four contributions follow. We present the Credential Function Decomposition framework and apply it to reorganisation of a literature that has been arguing itself. We define credential drift, discuss four possible sources of credential drift, and outline the type of evidence that could distinguish it from "normal" skill upgrading. We construct a comparative-advantage theory of the scope for and impossibility of what universities are (or are not) called on to do, based on the basis of skill depreciation, not institutional preference. And we judge the skills-based hiring movement based on its own evidence, and that's not so rosy.

2. Four Functions of the Credential

Figure 1 sets out the framework. A degree performs at least four functions concurrently, and Table 1 specifies each with its theoretical source, its beneficiary, and the observable implication that would distinguish it from the others.

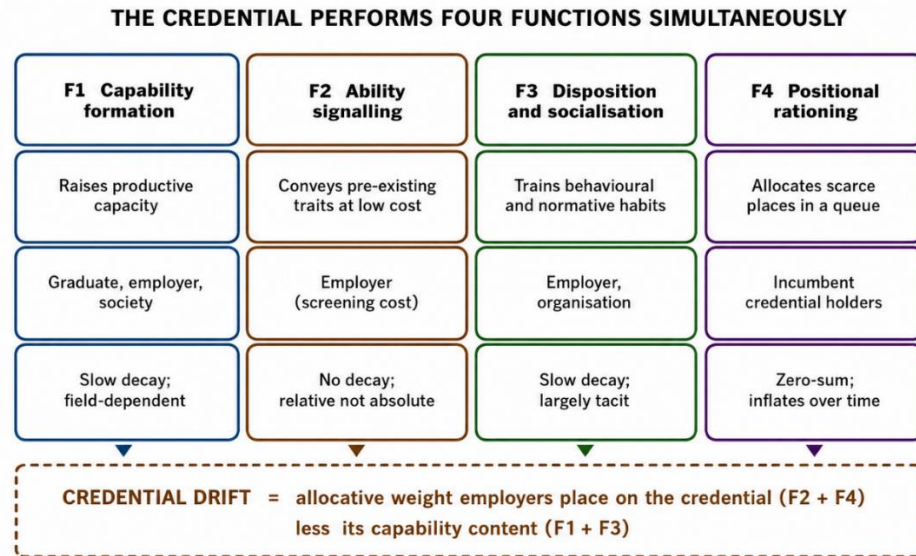


Figure 1. The Credential Function Decomposition (CFD) framework. The credential performs four functions simultaneously, with different beneficiaries and decay properties. Credential drift is the divergence between the allocative weight employers place on the credential and its capability content.

F1, capability formation. The human capital tradition holds that education raises productive capacity, and that the observed earnings premium reflects that increase (Becker, 1964; Mincer, 1974). Its strongest evidence comes from designs exploiting variation in schooling induced by policy rather than by choice, which consistently find positive causal returns (Card, 1999; Oreopoulos, 2006). Its most important refinement is that measured cognitive skill, rather than years of attainment, appears to carry much of the explanatory weight in cross-country and individual-level analyses, which implies that attainment is a proxy for the thing that matters rather than the thing itself (Hanushek & Woessmann, 2008; Hanushek et al., 2015).

F2, ability signalling. The screening tradition holds that education conveys information about pre-existing characteristics at lower cost to the able than to the less able, so that the credential can command a premium without altering productivity (Arrow, 1973; Spence, 1973; Stiglitz, 1975). Sheepskin effects are its canonical evidence: if a final year of study produces a discontinuous return relative to preceding years, the discontinuity attaches to certification rather than to accumulated learning (Hungerford & Solon, 1987; Jaeger & Page, 1996). The strong form of this position holds that a large share of the private return to education is signalling and that its social return is correspondingly smaller (Caplan, 2018).

F3, disposition and socialisation. A third tradition holds that schooling transmits behavioural and normative dispositions, including punctuality, deference to procedure, persistence under supervision, and tolerance of deferred reward (Bowles & Gintis, 1976). Modern labour economics reaches an adjacent conclusion from different premises, finding that non-cognitive characteristics predict labour-market outcomes with weight comparable to cognitive measures (Heckman et al., 2006), and that social skills have become increasingly complementary to cognitive skills in the returns structure (Deming, 2017; Weinberger, 2014). This function is genuine capability formation, but of a kind that neither curriculum documents nor employability metrics typically record.

F4, positional rationing. The sociological tradition treats credentials as instruments by which occupational groups control entry and by which advantaged families convert resources into position, so that the credential's value is inherently relative and its level inflates as access widens (Collins, 1979). The employability literature reaches a compatible conclusion, arguing that graduates compete positionally for a limited number of desirable positions and that individual capability improvements can leave relative position unchanged (Brown et al., 2003; Holmes, 2013).

Table 1. The four functions of the credential

Function	Theoretical source	Mechanism	Principal beneficiary	Distinguishing observable	Decay property
F1 Capability formation	Human capital theory	Instruction raises productive capacity	Graduate, employer, and society	Returns rise with years completed, not only with certification	Slow; varies sharply by field
F2 Ability signalling	Screening and signalling theory	Cost of acquisition differs by underlying ability	Employer, through reduced screening cost	Discontinuous return at certification	None in absolute terms; erodes as holders widen
F3 Disposition and socialisation	Social reproduction; non-cognitive skill research	Sustained exposure to institutional norms	Employer and organisation	Returns to attendance independent of measured cognitive gain	Slow; largely tacit and unmeasured
F4 Positional rationing	Credentialism; positional competition	Credential controls entry to a queue	Incumbent credential holders	Requirements rise without task change	Zero-sum; inflates mechanically with supply

A clarification is needed before proceeding. Identifying four functions is not the same as ranking them normatively. F1 and F3 are unambiguously productive. F2 is privately valuable to employers

and socially ambiguous, since it reduces screening cost while transferring that cost to applicants. F4 is largely redistributive. But a single practice frequently serves several at once, and it is not generally possible to retain the functions one approves of while discarding the others, because they run through the same institutional apparatus. This is the central difficulty for reform proposals that treat the credential as separable into a useful part and a wasteful one.

The framework's central methodological point is that these functions are entangled in every dataset. A single observed earnings premium is a composite of all four, and no research design isolates one without assumptions about the others. This is why the debate is so durable: each tradition can point to evidence its rivals cannot explain, and none can point to evidence that eliminates the rivals.

3. What the Evidence Can and Cannot Settle

Table 2 organises the principal empirical strategies by what each can identify and what it must assume. Read together, the pattern is not one of an unresolved question but of a question whose resolution differs by setting. Certification appears to carry substantial informational value where employers have few alternative signals, and little where they have many, which is exactly what signalling theory predicts and which explains why studies in different settings reach different conclusions without contradicting each other (Clark & Martorell, 2014; Tyler et al., 2000).

Table 2. Empirical strategies and what they can identify

Strategy	What it identifies	Principal assumption	Typical finding	Function it speaks to
Compulsory-schooling instruments	Local causal return to additional years	Instrument affects earnings only through schooling	Positive and substantial returns	F1, at the margin of compliers
Sheepskin and diploma discontinuities	Return attaching to certification net of years	No confounding change at the certification point	Discontinuities present in many settings	F2, and possibly F4
Regression-discontinuity at examination thresholds	Value of the certificate for near-identical candidates	Continuity of potential outcomes at the threshold	Mixed; limited value in some settings	F2, cleanly
Skills-based cross-country analysis	Return to measured competence rather than attainment	Comparable measurement across contexts	Competence dominates attainment	F1 versus F2 and F4 jointly
Field-of-study comparisons	Heterogeneity in returns across subjects	Selection into field is modelled	Very large dispersion by field	F1, and field-specific F4

Strategy	What it identifies	Principal assumption	Typical finding	Function it speaks to
Vacancy and postings analysis	Employer requirements independent of task content	Postings reflect genuine requirements	Requirements move with labour supply	F4, and drift
Overeducation and mismatch surveys	Divergence between qualification and job requirement	Self-reported requirement is meaningful	Substantial and persistent mismatch	Drift, indirectly

There are three cautions with respect to reading this literature. First, there is a huge amount of variation in aggregate returns by field, with variation across fields often greater than the average difference between graduates and non-graduates, and so any return to a degree statement (without qualification) is more or less meaningless (Altonji et al., 2012; Kirkeboen et al., 2016). Second, the evidence of skill shortages, measured by self-reported perceptions by employers, is not robust because in such situations, employers might just be referring to wage or search behaviour, as opposed to a lack of skills in the labour market, as discussed in considerable detail in the skill-gap literature (Cappelli, 2015). Third, there is some evidence of limited learning progress in higher education, where it has been documented, but this speaks to F1 and does not adjudicate F2, F3 or F4 (Arum & Roksa, 2011).

3.1 The overeducation and mismatch literature

A set of parallel studies investigate the destination, not the origin, of the degree and the idea is whether graduates end up in jobs that call for their qualification. Evidence from studies of this literature is consistently of high levels and persistence of overeducation, with a significant portion of graduates in jobs that do not call for a degree, and with penalties for mismatches being higher than penalties for well-matched graduates in the same occupations (Green & Zhu, 2010; Leuven & Oosterbeek, 2011; McGuinness, 2006). The persistence is key: if mismatch was a bridging characteristic of the entry into the labour market it would fade over time, and in a large proportion of cases it doesn't.

There are two interpretative caveats: both are directly relevant to the drift construct. First, the standard measure of overeducation, which asks what types of qualifications are required for a job, is likely to capture the actual requirement of the employer, not the actual requirement of the job, and thus where drift occurs, so do overeducation statistics to a large extent. Second, apparent overeducation may be due to a lack of uniformity in graduates, as a graduate in a non-graduate position could be less capable than the degree implies. Research that takes this into account has found that the issue of graduate oversupply is often exaggerated but not without reason, and that the issue is not so much the number of degrees as how many of high quality are matched to jobs of high quality (Green & Henseke, 2016). More comprehensive analyses of the link between education expansion and growth have also challenged the idea that more degrees equate to more productive (Wolf, 2002).

3.2 Comparative evidence from vocational systems.

No higher education institution is the strongest test of the prescription for vocationalisation. There is a great diversity in the timing of the vocational orientation of students in the education system, as well as in the extent to which the orientation is strong or weak, and this diversity provides the basis for a comparison that is not possible through one education system's debates on the curriculum. This is directly pertinent to the argument in Section 5, and is often ignored in the graduate employability literature. A series of analyses of the labour-market outcomes for people with vocational training and their generally educated counterparts at different ages across a large sample of countries reveal that vocationally trained individuals have an initial labour-market advantage over their generally educated peers, and this advantage erodes and eventually turns negative at older ages, with the shift to the negative occurring most sharply in countries with the most occupationally specific type of vocational training (Hanushek et al., 2017).

This is the actual depreciation argument, not the one that has been modelled. Specific training is timely – because it meets current need – yet late because it doesn't meet the future need and the capability to retrain was not provided instead. There is a trade off and that is why the finding should not be interpreted as a rejection of vocational education as such: a system that maximises early employment is making a sensible choice if that is the most important outcome, and for those who would otherwise drop out of education altogether the comparison is not general versus vocational, but vocational versus no education. The second point, again drawing on comparative analysis of educational systems, is that the relationship between social origin and educational attainment is weaker in systems with a more differentiated vocational system, in that the greater the vocational differentiation the weaker the relationship between social origin and attainment, and the greater the vocational differentiation the greater the allocation efficiency, but the reverse is also true: the greater the vocational differentiation the weaker the relationship between social origin and attainment and the weaker the relationship the greater the allocation efficiency, which means that allocation efficiency and equity are not jointly optimizable (Bol & van de Werfhorst, 2013).

The implication for this argument is less broad than a general verdict. But that the empirical pattern predicted by the skill-depreciation account has yet to be observed in the context of the design that allows it to be observed, and that policy discussions about higher education curricula are going forward largely without reference to it. An immediate research question is whether the same crossover is found within tertiary education as the specificity of the curriculum increases, a question now tractable using linked administrative data available in several countries, but not UK.

4. Credential Drift

4.1 Definition and mechanisms

We define credential drift as the divergence between the allocative weight employers place on a credential, which is the sum of its F2 and F4 functions, and its capability content, which is the sum of F1 and F3. Drift is positive when employers require a credential for reasons unconnected to the capability the role demands. Figure 2 illustrates its dynamics against a measure of underlying task complexity.

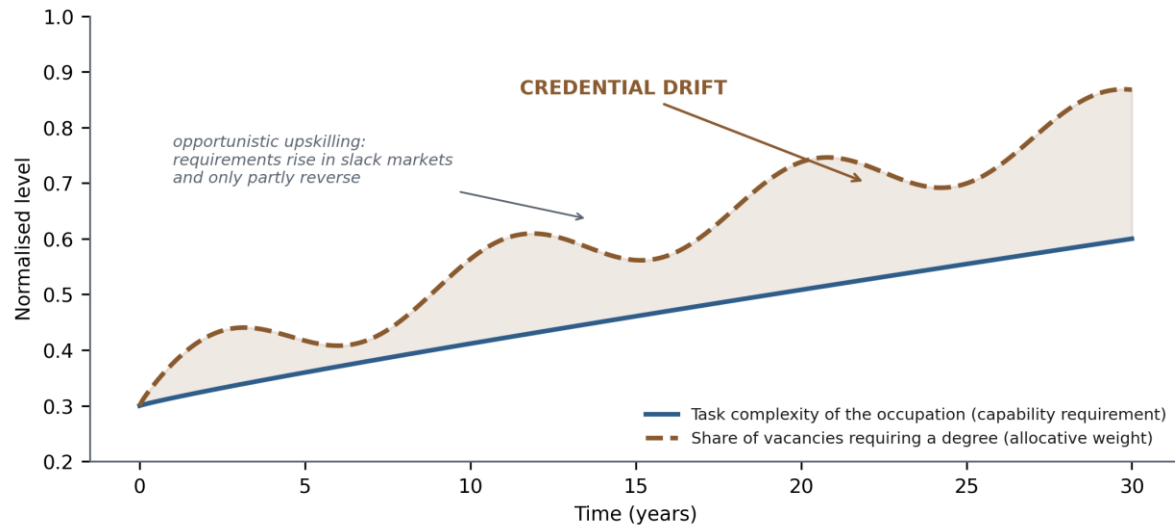


Figure 2. Credential drift. Task complexity of an occupation and the share of vacancies requiring a degree, showing the drift wedge and the cyclical component associated with opportunistic upskilling in slack labour markets.

There are four mechanisms which give rise to drift, and they are clearly distinguishable. Opportunistic upskilling happens when employers increase stated requirements when there is a large labour supply shock but not when there is a change in tasks, and vacancy data suggests that requirements shift with the local labour supply shock, beyond what is explained by task content (Modestino et al., 2020). This is the most harmful way for a pure human-capital interpretation of the requirements, as requirements disappear when students are plentiful and they reappear when they are scarce. Adverse effects of screening-cost transfer are that the use of the credential by an employer lowers the number of applicants, which is individually rational for the applicant, but collectively costly because the cost of the screening is paid for by the applicant who needs to earn the credential to pass the screening. Positional escalation is an automatic consequence of rising attainment; the more people there are who attain a qualification, the less they can distinguish, and the higher the attainment level they need to distinguish rises with (Collins, 1979). The three are compounded by automated screening, as configurations for applicant-tracking often include degree filters as "hard" criteria, meaning that candidates who have the experience required by the job but not the degree would be excluded; this is a significant and largely unrecognized source of exclusion, as found in the analysis of so-called "hidden workers" (Fuller et al., 2021).

Table 3. Mechanisms of credential drift

Mechanism	Description	Distinguishing evidence	Who bears the cost	Policy handle
Opportunistic upskilling	Requirements rise with labour supply, not task content	Requirement rates covary with local unemployment	Excluded non-graduate applicants	Employer disclosure of genuine requirements

Mechanism	Description	Distinguishing evidence	Who bears the cost	Policy handle
Screening-cost transfer	Credential used as a volume filter	Requirement present where task analysis shows no need	Students, who fund the filter	Alternative low-cost assessment infrastructure
Positional escalation	Distinguishing power falls as attainment widens	Requirement level rises with cohort attainment	Later cohorts; marginal entrants	Occupational licensing and entry-standard review
Automated screening	Degree encoded as a hard filter in hiring systems	Qualified non-graduates rejected before review	Experienced workers without degrees	Audit of screening configurations
Risk aversion in hiring	Credential functions as defensible justification for a decision	Requirement strongest where hiring errors are visible	Non-traditional candidates	Structured evidence-based selection

4.2 Why drift is not the same as skill upgrading

The competing interpretation of the rising requirements is that as skills rise, so do the requirements, a hypothesis that technology has actually increased (Autor et al., 2003; Autor, 2015). The difference is physically distinguishable. Skill upgrading theory would suggest that requirement growth is clustered in occupations that have actually experienced a change in their task content, that requirements continue to increase over time, and that there are measurable differences in productivity between the graduate and non-graduate workers with the same occupation. Drift's foretells the contrary on every beat. The most important discriminator is the cyclical evidence, as real task change is not related to falling unemployment (Modestino et al., 2020). The realistic answer is that both processes are going on and that it is the relative size of these within an occupation that is relevant to the policy and that can be estimated rather than just argued.

4.3 The social cost of drift

Drift is a cost that is different from the cost of the regular inflation of credentials. The first is allocative: there are jobs that able workers could do, but they don't, and that's not reflected in aggregate level measures as the non-hired were never even reported as a failure rate. The second problem is investment distortion: If a student is faced with a filter, he or she will make the rational investment decision whatever the capability content of the credential is, and with this rational choice of investment, private demand for higher education is partially demand for a filter and not for the education itself, so that the marginal student's return is lower than the average return that led him or her to make the investment. The third is informational: Once the scale of the credential becomes larger and the number of credentialists becomes larger, its power to discriminate

decreases, and this pressure further escalates the number of credentialists. The notion that credentialing is self-propelling and not self-correcting is not new, and it is a theme that is continued by sociological research into credentialing (Bills, 2003; Collins, 1979).

A thought must be put against these costs, the drift framing can obscure. Education, if it is a positive externality with a private return, can have social efficiency in the face of some private over-investment as evidence on human capital spillovers indicates (Moretti, 2004). This does not excuse drift, which doesn't cost anything to the filter, but simply that the welfare arithmetic is not just about saving the cost of the filter versus the value of the information it provides.

5. What the Labour Market Actually Rewards

The task-based framework suggests that technology replaces tasks that are routine, and augments non-routine ones, thus yielding returns to skills that are not easily codified (Acemoglu & Autor, 2011; Autor et al., 2003). There are two implications that arise from the degrees-versus-skills issue, and both run counter to the vocational prescription.

The first relates to depreciation. It has been found that the early returns to higher education courses are large for those who are trained in more technically oriented skills, but smaller for those trained in more general skills, and that the early returns diminish with the introduction of more contentious skills; and that these courses generally have a large early return, although this is of a different kind than the early return, because the early returns to more contentious skills become obsolete as time goes on (Evidence on career earnings dynamics, 2020), so that the early return to a technically specialised course is qualitatively different from the early return to a course. The informally stated depreciation profiles of figure 3 are defined and the resulting curricular allocation for each of these profiles is calculated at varying planning horizons.

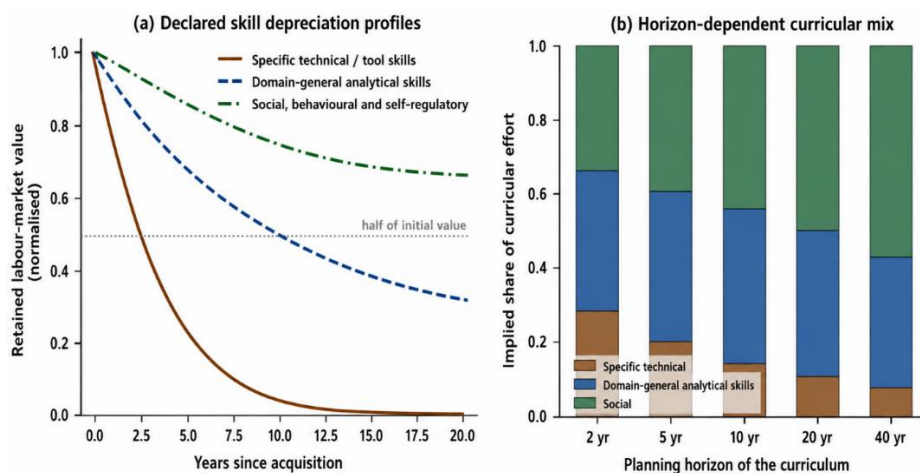


Figure 3. Panel (a) declared depreciation profiles for three skill layers. Panel (b) the implied share of curricular effort at alternative planning horizons, computed as integrated retained value. All values are generated from declared parameters and illustrate model behaviour only; they are not empirical estimates.

Since the diffusion of generative systems another issue has become salient. Experimental evidence on the use of such systems in the workplace reports significant productivity impacts that are often more pronounced for less experienced workers, suggesting, if this generalises, that the returns to narrowly codifiable, procedural competences are being compressed, and that vocational curricula are most effective at teaching those skills. If it generalises, this suggests that the returns to codifiable, procedural competences are being compressed, and that the vocational curricula are best at teaching them -- which is what has been reported in the experimental literature on the use of such systems in the workplace, at least for less experienced workers (Brynjolfsson et al., 2023; Noy & Zhang, 2023). The mechanism is simple when discussed in terms of the task framework, that is, capability that can be specified in a way that allows training to be done rapidly is capability that can be specified in a way that allows automation or assistance to be done. Should this be the case, the depreciation rate for the specific layer increases further, the comparative-advantage case for universities specializing in the general and social layers becomes stronger, and the popular and currently prevailing prescription becomes more difficult to argue. This evidence is preliminary and the extent to which it can be generalised to other tasks is very unclear; therefore, this does not constitute a definitive basis for that argument.

The second is related to complementarity. The returns to social and interpersonal ability have increased and they seem to have proved to be complementary, rather than a substitute for cognitive ability, so that the combination is increasingly valued by the labour market, and not either/or as it used to be (Deming, 2017; Weinberger, 2014). This is important because social capability is a paradigm example of F3 as it is developed through sustained engagement in a challenging institutional environment, not by explicit teaching, it is not written on any transcript, and it is invisible to precisely the set of employability indicators on which policy measures and indicators of the effectiveness of universities in preparing students for their employability.

Table 4. Skill layers, depreciation, and institutional comparative advantage

Layer	Examples	Depreciation	Best-positioned provider	Consequence of misallocating provision
Specific technical and tool skills	Current software, platforms, protocols, procedures	Fast	Employer, at the point of use	Curriculum obsolete before graduation; recurring retraining cost falls on the graduate
Domain-general analytical capability	Formal reasoning, modelling, evidence evaluation, writing	Slow	University	Graduates cannot acquire the substrate later; deficit is not remediable on the job
Social, behavioural and self-regulatory capability	Collaboration, persuasion, persistence, self-direction	Very slow	Any sustained demanding environment	Rarely taught explicitly; developed by participation, not instruction

Layer	Examples	Depreciation	Best-positioned provider	Consequence of misallocating provision
Domain knowledge with long half-life	Disciplinary structure, theory, standards, law	Slow to moderate	University and professional body	Erodes with curricular vocationalisation
Credential-signalled dispositions	Persistence, procedural compliance	Slow	University, incidentally	Undervalued because unmeasured

6. What Universities Can and Cannot Reasonably Be Asked to Do

Table 4 is the basis for the comparative-advantage argument. Universities have a multi-year production cycle, and there is a lag of many years between the design of the curricula, and the arrival of the students in the labor market. Employers are at the point of use and know the tools available and can quickly switch them out. Inverting the efficient allocation – assigning fast depreciating skills to the slow cycle institution and slow depreciating capability to the fast cycle institution. The impact is well-known: vocational content is specified and courses are outdated at the time of delivery, and graduates' abilities are a one-shot deal that has to produce content with a 5-year shelf life.

This is not a critique of the value of work-integrated learning, which is based on other principles. Placement and project-based learning is the foundation for developing F3 capability and it cannot be covered by classroom instruction, and offers access to networks that have a direct impact on early labour-market outcomes. The more advanced claims made in the employability literature make exactly this distinction: employability is a set of capitals or a 'claim to identity' claimed within context, not a bundle of teachable attributes possessed by the individual (Clarke, 2018; Holmes, 2013; Tomlinson, 2017). The speech is an objection to the special proposition to reorganise curricula around the technical content now needed.

Table 5 outlines a division of responsibility based on the analysis. There are two features to be noted. First of all, some of the listed university tasks are already being carried out and invisibly so, since they are not being captured by employability indicators; the framework implies that it is necessary to reform measurement, not only as a consequence of curricular policies, but as a condition for sensible policies. Secondly, it is historically an employer responsibility which the employers have borne, and the shifting of responsibility to the education system is a comparatively new phenomenon that cannot be substantiated by an analysis of comparative advantage.

Table 5. A division of responsibility implied by the analysis

Responsibility	Appropriate holder	Rationale	Current practice	Required change
Domain-general analytical capability	University	Slow depreciation; not acquirable later	Discharged, but under pressure from vocationalisation	Protect from curricular displacement
Disciplinary knowledge and standards	University and professional body	Long half-life; requires structured sequence	Discharged	Maintain
Contextual and tacit workplace knowledge	Employer, with university facilitation	Only available at the point of practice	Partially transferred to universities	Restore through structured placement, not simulation
Current tool and platform proficiency	Employer	Depreciates faster than the curricular cycle	Increasingly demanded of universities	Decline the transfer explicitly
Assessment infrastructure for non-graduates	Employer, sector body, or state	Absence of it is what makes the degree a default filter	Largely absent	Build; this is the binding constraint on skills-based hiring
Evidence on graduate outcomes	State and institution jointly	Required for any calibration of the above	Narrow metrics dominated by early earnings	Extend horizon and capability measurement

6.1 Why the demand for vocationalisation persists

The persistence and intensity of the demand that universities should become more vocational needs to be explained, if the comparative-advantage argument is correct. It is supported by four arguments, but none of them is substantiation of a solid demand. The first is measurement: the metrics used for outcomes of graduation are dominated by early destinations and starting salaries, which is to say by the time when specific technical content appears to be most valuable and most capability appears to be least so. A system measured over a two-year period will be forced to follow a two-year course and Figure 3 shows the arithmetic of the pressure.

The second one is cost transfer. The cost of training by a private employer is an expense to the employer, while the cost of training by a university is an expense to the student. The movement of this fast-depreciating layer to the education system is therefore appealing to employers, regardless of its efficiency, and the language of graduate underpreparedness will make the transition. The third is the visibility asymmetry mentioned in P5, which concerns the capabilities that the university offers most: the university's contribution is not systematically overstated in the evidence

it produces to evaluate itself. The fourth is a genuine and legitimate concern. Curricula however do occasionally fall behind, especially in industries in a very rapid state of technological change, and predictions of technological displacement have added urgency to this concern (Frey & Osborne, 2017). The framework contains these distinctions: Lag in the slow-depreciating layer is indeed a real failure of the institution and should be rectified; lag in the fast-depreciating layer is a characteristic of the division of labour and should not.

6.2 The missing assessment infrastructure

Section 7 concludes that the problem with skills-based hiring is that there is no viable alternative to the degree as a signal. That statement needs to be expanded, as it points to where reform effort would be paying. There has been a long history of research on the predictive validity of a wide variety of assessment methods for job performance, and the general ordering of their predictive power has been reasonably consistent over the last 40 years: structured work-sample tests, structured interviews, and general mental ability tests predict job performance better than do unstructured tests, interviews, and measures of education or credentials, respectively (Schmidt & Hunter, 1998). Most of these estimates have since been lowered through reanalysis, and some of the methods have been reordered, primarily due to correction for range restriction assumptions that overestimated earlier estimates, but the main practical implication remains: job-relevant assessment, which is structured, is a significantly better predictor of performance than the credential (Sackett et al., 2022).

So the question is why is it that employers use the weaker instrument? Ignorance is not to blame, the answer is cost. A degree requirement is free to apply, delivered as a degree, delivered pre-verified, and does not involve design work; a structured work sample must be constructed for every role, administered, scored and defended. The cost of the better instrument is fixed for an employer who has to hire a few employees, so it is not worth it for him to hire that instrument, although the cost of the inferior instrument over the entire labour market is enormous. This is a typical public good organization, which is why the assessment system that would supplant the credential has not yet been developed in a private sector initiative and probably won't be.

It also indicates what would work. Any assessment that would have the properties the degree currently enjoys is a by-product of being portable across employers, independently validated, and cheap at the point of use; and making them available deliberately would be much cheaper than the current situation where every applicant pays for a three-year filter. The problem is not one of invention but one of extension, as is already done in some occupations with instruments of this kind, with sectoral bodies, professional associations, licensing authorities. Until there's such an infrastructure, exhortation to a skills-based hiring will have its employers give up a filter that works for them, and P6 says they won't.

7. Skills-Based Hiring: Rhetoric and Practice

The easy remedy to the problem of drift is to hire on skill not credential—and a significant number of people are now calling for this. Employer need analyses have shown a later increase in the stated requirement for degrees that are unrelated to task requirements, and then a partial reversal of the stated requirement (Fuller et al., 2017, 2022). Is there behavioural change as a result of stated change? However, the most careful evaluation to date suggests that it has not, as degree

requirements continue to be associated with only a slight increase in the hiring of degree-holders, but little change in the hiring of individual candidates, as compared to what degree requirements were announced to be related to. (Sigelman et al., 2024)

The framework, which justifies this, is detailed below. If a stated requirement is removed, F4, the formal rationing function, is removed, and F2 is not: the employer still requires a low-cost signal of ability, and still doesn't have an alternative. When there is no alternative assessment system, the credential remains in operation, albeit informally, to shortlist, even after it has been withdrawn from the posting. This leads to the following specific and testable prediction: The impact of the removal of a requirement on non-graduate hiring depends on the availability of an alternative assessment, and is near zero when there is no alternative assessment, as stated as P6 below. It also singles out the single thing that prevents the entire skills-based hiring movement from taking off: employers aren't interested in it, they're interested in proof of capability that is easily accessible, cost-effective, portable — but isn't from a university.

Table 6. Propositions

Proposition	Statement	Warrant	Focal constructs
P1	The observed earnings premium is a composite of four functions, and no single-equation estimate identifies any one of them without assumptions about the others.	CFD framework	Premium decomposition; identification
P2	Signalling value is decreasing in the availability of alternative signals, which explains divergent findings across certification settings.	Screening theory	Signal density; certification return
P3	Credential drift is positive and cyclical, rising in slack labour markets and only partially reversing in tight ones.	Opportunistic upskilling evidence	Requirement rate; labour-market slack; task content
P4	Curricular vocationalisation reduces lifetime returns relative to early-career returns, because it substitutes fast-depreciating for slow-depreciating capability.	Skill depreciation dynamics	Curricular mix; earnings profile shape
P5	A substantial share of what employers value in graduates is F3 capability that no employability metric records, so measured employability understates university contribution.	Non-cognitive skill research	Disposition measures; metric coverage

Proposition	Statement	Warrant	Focal constructs
P6	Removing degree requirements raises non-graduate hiring only where alternative assessment infrastructure exists; absent it, the effect is near zero.	Signalling; skills-based hiring evidence	Requirement removal; assessment availability; hires
P7	Field-of-study variance in returns exceeds graduate versus non-graduate variance, so aggregate statements about the value of a degree are uninformative.	Field heterogeneity evidence	Between-field variance; between-level variance

8. Analytical Protocol

The framework has two assertions that are not about sign, i.e. not about morphology. To make the depreciation argument formal, we state the parameters of the three layers of skills that are explicitly described in the panel (a), and then integrate over each of the planning horizons from 2 to 40 years in the panel (b) to determine the share of the curricular effort for each horizon. The result is not a recommendation, it is an expression of sensitivity: the best curricular mixture is strongly dependent on the time horizon over which the curriculum is optimized, and a two-year horizon is equivalent to optimizing for a graduate starting salary. The set of parameters is recorded in Table 7 and the template of estimation is shown below. Parameters are not estimated but declared; the figure is just a demonstration of the behaviour of the model.

Table 7. Simulation parameters and estimation template with placeholder notation

Element	Specification	Declared value or placeholder	Role
Specific-skill decay	Exponential decay rate per year	0.26	Implies a short half-life for tool-specific content
General-analytical decay	Exponential decay rate per year	0.055	Implies a long half-life
Social-behavioural decay	Exponential decay rate per year	0.018	Implies a very long half-life
Horizon set	Curricular planning horizons compared	2, 5, 10, 20, 40 years	Drives the allocation result
Drift wedge	Requirement rate less task-complexity index	Constructed from postings and task data	Operationalises drift

Element	Specification	Declared value or placeholder	Role
P1 test	Decomposition using field, certification, and competence measures jointly	Component shares [a1] to [a4]	Requires competence measurement independent of attainment
P2 test	Certification return interacted with signal density in the setting	Interaction [b2]	Signal density proxied by availability of alternative evidence
P3 test	Requirement rate on local slack, controlling for task content	Coefficient [b3]; asymmetry [b3a]	Panel of postings with occupation fixed effects
P4 test	Earnings profile shape on curricular specificity at entry	Profile curvature [b4]	Requires long-horizon linked earnings data
P5 test	Employer-rated graduate value on recorded versus unrecorded capability	Coefficients [b5r], [b5u]	Tests metric coverage rather than capability itself
P6 test	Non-graduate hires on requirement removal, interacted with assessment availability	Interaction [b6]	Difference-in-differences at firm-occupation level
P7 test	Variance decomposition of returns by field versus by level	Variance shares [v7f], [v7l]	Administrative earnings data by field

Four measurement cautions apply. Self-reported employer skill shortage is not evidence of a capability deficit in the workforce and should not be used as an outcome (Cappelli, 2015). Job postings are a measure of stated requirements rather than of hiring behaviour, and P6 exists precisely because the two diverge. Overeducation measures based on self-reported job requirements inherit the drift they are meant to measure, since respondents report the requirement the employer states. Finally, selection into higher education is pervasive and any capability comparison between graduates and non-graduates without credible identification recovers selection rather than effect.

9. Discussion

9.1 Answering the question in the title

The framework produces an answer, it is not a simple answer. The universities do produce work-ready graduates—though, as a rule, not as well as they ought to do, partly because the public discussion rates the same measure of success over the short term. They also may award credentials for rationing and screening purposes other than preparing for that purpose, and this has increased in weight for a variety of reasons that are largely outside the control of the institution. So the claim

that universities create certificates is therefore wrong in itself, and refers to what is actual: The allocative weight of the credential has separated from its capability content, and universities are benefiting from that separation without having caused it.

The discouraging message here is that the most significant changes are never curricular. Drift reduction is driven by building the infrastructure necessary to eliminate drift; auditing automated screening; and limiting opportunistic requirement inflation. None of these is a university responsibility and none of these ends up being solved by an increase in the vocational nature of universities, while at the same time lowering the one comparative advantage universities have.

9.2 Equity implications

Drift has a distributional signature. The filter property of the credential means that the cost goes to the students who need it to pass, and this cost is regressive - that is, a higher proportion of lifetime resource for the student with no family resources and a higher risk for the student with no family resources. The position account of graduate competition also illustrates that advantaged students transform resources into differentiating experiences, and increasing access to the credential can result in no change in relative position, but increase the cost of admission for all (Brown et al., 2003). There has been a longstanding critique of the human capital theory as a policy framework that has focused on this disconnect between human capital theory and the actual position structure students are in (e.g. Marginson, 2019). Any assessment of drift which takes into account only aggregate efficiency will miss the bulk of its welfare effect.

9.3 Systems in rapid expansion

In systems with extremely high rates of growth over a low base, such as much of South and Southeast Asia, areas of Africa and Latin America, the various parts of the system are not all equally weighted. Three differences matter. First, the rationing function F4 is probably going to be more of a factor, as the number of holders is growing at a higher rate than the number of jobs at the graduate level (as defined by the occupation function F2) in the occupational structure, leading to escalation pressure of the sort outlined in Section 4.1 which is occurring at a more rapid rate than in mature systems. Second, there is generally a much greater dispersion of quality across institutions than in systems with long-established accrediting systems, and employers rely on the institutional identity rather than the credential itself as a screening device, making the credential more of a positional instrument and breaking its link with capability for most credential holders. Third, if a high percentage of jobs are informal, the signalling effect of the credential is only present for the formal sector of the labour market, and the reported graduate premium in aggregate statistics does not reflect the economy but rather the selected labour market.

The differences do not mean that the framework is invalid, but that different propositions bind. The cyclical drift proposition P3 is likely to be less strong in areas with limited formal vacancy information. P7, which examines variance in fields of study, is likely to be stronger, as this will generally be very high in rapidly expanding systems. The assessment-infrastructure argument in Section 6.2 is made that much more pressing, as the lack of information in the informational void these systems face is precisely the place where there would be the most opportunity for a portable, independently verified signal to produce the most gain. Testing the framework in such environments is consequently not to confirm a result found in another place, but where it has unique predictions.

9.4 What would change the argument

The framework is disprovable, and it is good to mention what will disprove it. From there, if it turns out that requirement increases are limited to occupations that have task change that is clearly identifiable, but not co-varying with labour-market slack once task content is held constant, the drift construct would lose its main empirical support and the skill-upgrading account would do just as well. If the early-career premium to technologically specific fields did not decline, but instead, increased (as in Section 5), the case for vocationalisation would become much stronger. P6 would be a failure if it was discovered that there would be a significant increase in the number of individuals hired at a higher level of degree if there were no alternative assessment, and that such a function would be less important than claimed. But if the measure of employability was found to be good indicator of the ability of F3, the asymmetry of visibility in P5 would disappear. They are all quantifiable with current data infrastructure — hence their declaration.

9.5 Limitations

There are 3 restrictions that should be clearly put down. It is a conceptual paper – the propositions are not tested with the simulation showing internal consistency, not necessarily a correspondence with any empirical population; the parameters are declared, and Figure 3 should not be interpreted as an estimate of any actual depreciation rate. Second, characterizations of the empirical literature do not attempt to reproduce numerical estimates but instead describe direction and pattern; readers are directed to the cited studies for numerical estimates and intervals, and must be aware that identification is still a subject of debate in this literature, and that several of the central findings are still hotly debated. Third, the evidence base is skewed towards high income economies that have mass higher education systems and formal labour markets, in systems with large informal sectors, with lower quality signals in the system and with rapidly growing higher education enrolments, this rationing function is likely to be more prominent than is indicated in the evidence cited here and the propositions of the framework should be tested and not assumed to be transferable.

10. Conclusion

The issue of whether universities train people for 'real work' or just award credentials is based on the assumption that they are mutually exclusive. They are not. The credential does four things at once: it makes a person capable, it signals a person's ability, it conveys the disposition of the person, and it limits access for the person; and the public discussion of evidence has been going on for decades as if evidence for one thing is evidence against another. But by separating them, the dispute is manageable and the issue can be moved. In practice, it's not that universities ceased to educate useful skills that were desired by employers, it is that the value that employers assign to the credential has shifted beyond what's in the credential, due to things such as labour market slack, screening cost, and automated filtering that has nothing to do with curricula. The reply below is other than the one in which the player is currently working. The capacity to offer slow depreciating training should be protected by the university and not handed over to the employer as fast depreciating capacity. Employers and states should develop the assessment infrastructure that is missing from the landscape, which is what makes the degree the default filter, and that the skills-based hiring movement will keep making announcements about. But the measurement needs to be continued beyond the first survey of destinations, as a system judged on a graduate's starting salary

will be optimized for a two-year period and the outcome would be called employability. The seven propositions and analytical protocol proposed here are designed to be testable, not merely rhetorical, in order to be refutable.

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