Depreciation analysis and filter model review

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Abstract:

Deciding to invest in oneself is not a direct and simple action. It is as complicated as it took a good time to besiege the factors influencing this investment process. In this respect, many approaches have emerged, sometimes contradictory, and complementary in other cases. The introduction of depreciation raises the challenge to pinpoint the problem, which remains so far fierce to any domestication.

This paper presents a model that takes into account these different lines (such as the average level of aptitude of the entire population, the degree of homogeneity of skills within the same type of diploma). It turns out that the market value of a diploma tends to zero if the dispersion of skills is equal to productivity multiplied by the average aptitude of this level. A new conception of investment in education is thus formed, in which the price awarded to diplomas depends largely on the ability, whatever the average, or in terms of variance, stopping their investment in training at the same level.

Key words: investment, aptitude, diploma, depreciation, gain, training.

JEL classification: J41, J31, J24, I21.

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Introduction:

This is another aspect of adjustment between supply and demand in the labor market that can be addressed through decommissioning, which in its first approximation means having a higher level of training than necessary. To hold a specific job it manifests itself in the profound changes in the labor market, and essentially in terms of increasing skill requirements, on the one hand, and the school boom on the other. Thus, there is a significant gap between the rates of progression of diplomas, and that of posts creates.

Decommissioning situations can be located either in relation to employment, in which case employees are overqualified in relation to the job they hold or in relation to the expected remuneration given their qualification.

An individual who decides to invest in an additional year of study expects in return to draw a salary surplus in the labor market. If, in the end, he earns less than less qualified employees, he is considered to be in a situation of declining pay.

This phenomenon of decommissioning has been dealt with by several approaches where according to the theory of human capital (Mincer 1976), and through the distinction between general human capital (CH) (resulting from a diploma) and specific CH (training). on the job), supposes a process of substitutability between these two forms. The declassification (Andries De Grip and Jasper Van Loo 2002) apparently based only on the first form (diploma), is not the only measure necessary for the job, so it can be substituted by the second form of way to return to the normal trajectory.

The second approach is the matching theory (Pissarides 2000), which assumes that the decommissioning is the result of a lack of information where according to this theory the individual makes a mistake in the course of research of employment (Jovanovic 1979). But this situation is understood as a short-term phenomenon, where the reasoning is that the declassed individuals will leave the job sooner or later in order to obtain another more adapted to their level of training.

According to the reporting model (Spence 1973), productivity is reported by the diploma, the cost of which is inversely related to aptitude. Thus, the decommissioning comes from the marginalization of these costs (Philippe Lemistre 2003).

A new trend in the literature; illustrated by such articles as Groot (1998), Arrazola & Hevia (2004), Arrazola, Hevia, Risueno & Sanz (2005) and Wu (2007). Their methodology is, however, very indirect, the estimation of the depreciation resulting from the combination of several parameters plus a set of additional hypotheses.

The literature we have consulted, however, has revealed no typology of the consequences of neither depreciation nor the associated models explaining the mutual relation between the possible effects (Jones, Chonko & Roberts, 2004, Neuman & Weiss, 1995; Loo 2005, Shearer & Steger 1975, Thijssen 2005, Lien Laureys 2014, Zafar Nazarov, Nodir Adilov & Heather LR 2018).

All these theories show that decommissioning deserves special attention and they illustrate the diagnosis of a major change in our society, worrying and alarmist diagnosis for our social cohesion.

The article is organized as follows:

Section I discusses the general presentation of the model by distinguishing the factors that determine the market value of a diploma

Section II examines the functions that allow the restructuring of the information equilibrium, and thus distinguishes the parameters guiding the decisions.

Section III discusses the impact of this modeling on the determination of equilibrium, and introduces new factors that can capture the boundaries between training and suitability for the job.

Section IV completes the study with a re-examination of the filter model and these implications affecting individual choice and balance in the labor market.

1- The market value of a diploma:

The effective filtering of skills can in some cases improve the amalgams that affect degrees, not only through the detection of the most productive skills, but also the remuneration is more homogeneous, that is to say that employers will discern in each degree level the same productivity for all individuals. Thus, the latter can benefit from a remuneration which is no longer sanctioned by the dispersion of skills for the same degree of diploma. Since then, the market value of a diploma depends on the average level of aptitude of the entire population, and the degree of homogeneity of skills within the same type of diploma. For this, we consider the construction of the following equation:

$V_e = P_e \overline{A}_e - Var(A_e)$ [2]

Or :

V_e : the market value of the diploma « e », for $e = 0 \ldots n$.

P_e : individual productivity that provides a degree « e ».

$\overline{A}_e$: Average aptitude for diploma « e ».

$Var(A_e)$: the variance of ability felt for the same degree level.

A_e : individual aptitude holding a diploma « e ».

With :

$$\frac{A_0}{\overline{A}_0} = \beta^{-\gamma}$$

Where « β » is the basic coefficient of variation, « γ » the elasticity of this coefficient compared to the level of study which is supposed to decrease with this level.

This proposed model establishes an important notion that within the same degree level there are several individuals of different abilities. But this dispersion deteriorates as the level increases.

The valorization of a given level of a diploma depends essentially on the entire cohort that holds it, and even individual decisions will be largely influenced by this constraint.

$P_e = (1+\alpha)P_{e-1}$ $\qquad$ $\overline{A}_e = (1+\alpha)\overline{A}_{e-1}$ $\qquad$ $A_e = (1+\alpha)A_{e-1}$

"α" : the supplement following the transfer from one level to another in terms of productivity or average or individual aptitude.

So, we will have:

$$\begin{aligned} V_e &= P_e \overline{A}_e - Var(A_e). \\ &= P_{e-1}(1+\alpha)(1+\alpha)\overline{A}_{e-1} - Var\left[(1+\alpha)A_{e-1}\right] \\ &= \ldots \\ &= \ldots \\ &= P_0(1+\alpha)^e(1+\alpha)^e\overline{A}_0 - Var\left[(1+\alpha)^e A_0\right] \\ &= P_0(1+\alpha)^{2e}\overline{A}_0 - (1+\alpha)^{2e}Var(A_0). \end{aligned}$$

We know that productivity at the zero level (without a degree) is reduced to the ability to "A_0".

$$\Rightarrow V_e = (1+\alpha)^{2\alpha}\overline{A}_0 A_0 - (1+\alpha)^{2\alpha}Var(A_0) \ .$$

[2] This model is inspired by the model of the filter and signals.

Similarly, we know that:

$$VarA_0 = \beta^{-\gamma} \text{ et } A_0 = \overline{A}_0 \beta^{-\gamma}$$

$$\rightarrow V_e = (1+\alpha)^{2\alpha}\, \overline{A}_0^2 \beta^{-\gamma} - (1+\alpha)^{2\alpha}\, \beta^{-\gamma}.$$

$$= (1+\alpha)^{2\alpha}\, \beta^{-\gamma} (\overline{A}_0^2 - 1).$$

$\rightarrow LogV_e = 2eLog(1+\alpha) + Log(A_0^2 - 1) - \gamma Log\beta$.

And since:

$\overline{A}_0 \succ\succ 1 \Leftrightarrow Log\overline{A}_0^2 - 1 \approx Log\overline{A}_0^2$

$$\rightarrow LogV_e = 2ePM + 2\overline{A}_0 - \gamma\beta$$

The market value of a degree depends on individual and collective skill productivity rates and the average level of basic skills of the general population. This value is devalued by the dispersion of skills within the same level. What makes, the more the boundaries between the levels are destroyed, the more the number of agents incited to invest in training is large, the variance of aptitude swells, and the market value of the diploma deteriorates.

If $V_e \rightarrow 0 \rightarrow P_e\overline{A}_e - Var(A_e) = 0$

$$\rightarrow P_e\overline{A}_e = Var(A_e)$$

The market value of a diploma tends to zero if the dispersion of skills is equal to productivity multiplied by the average aptitude of this level, that is to say that this level is so dispersed in terms of aptitude that there is a great variety of aptitude in this cohort. This level is accessible to everyone and therefore non-exploitable, which means that we generate a complete uncertainty about the true value of "$P_e\overline{A}_e$".

If "$V_e \rightarrow \infty$" $\rightarrow$"$VarA_e \rightarrow 0$" that is to say on the degree level « e » we find the same aptitudes. So, the boundaries between the levels are well constructed (there is a strong homogeneity of aptitude in the same cohort), and "$P_e \rightarrow \infty$", translating that the contribution to productive knowledge of training increases, which is directly related to the increase in the duration of study.

Thus, the value of diplomas increases. However, it builds a logic relating to investment in human capital (H.C), where the price awarded to diplomas depends largely on ability whatever is on average or in terms of variance stopping their investment in training at the same level.

As a result, selection is found to increase relatively the productivity and value of training.

2- *Restructuring of the information balance and implication:*

Now, we will resume the analysis of the group side based on the cost structure resulting in an informational balance. Let's go back to two skill groups:

"A_h" and "A_f", we know that:

$$U(w, e/\theta) = w(e) - C(e , A)$$

Where $C(e, A)$ is the cost of acquiring a level of training « e » for an aptitude individual "A" checking the usual conditions already established, and adding another:

$$\frac{d^2C}{de.da} \prec 0$$

This phrase means that the most able agents are always willing to pay -an additional unit of "e"- than those of low ability.

The remuneration is such that:

$$w(e) = \mu(e)A_h + [1 - \mu(e)]A_f$$

Therefore, "$w(e)$ " is between "A_h" et "A_f", with "$\mu(e)$" is the proportion of able-bodied individuals in the operational population at the interval $[0 , 1]$. But to have a separating balance, companies offer a level "e^*" of which they are certain that for:

$e < e^*$, $P(A_f) = 1$ and the salary will be $w^*_f = A_f$

And for:

$e \geq e^*$, $P(A_h) = 1$ and the salary will be $w^*_h = A_h$.

This balance sets the following conditions for it to be achieved:

For individuals of the type "A_f" : $w^*_f = A_f > A_h - C(A_f)e^*_h$ [1]

For individuals of the type "A_h" : $w^*_h = A_h - C(A_h)e^*_h > A_f$ [2] with "$C_f > C_h$".

[1] ➔ $e^*_h > (A_h - A_f)/C_f$

[2] ➔ $e^*_h < (A_h - A_f)/C_h$.

➔ $(A_h - A_f)/C_f < e^*_h < (A_h - A_f)/C_h$.

➔ $\Delta A/C_f < e^*_h < \Delta A/C_h$

It is a condition that establishes that the level "e^*_h" is high enough to deter those less able to get it.

If this condition is not verified, i.e. "$e^*_h < \Delta A/C_f$" , we see a situation where all individuals will have the level e^* this is because:

- "ΔA" is very tall ("C_f" fixed): that is to say the opportunities of gain, when one gets at the level "e^*_h", is very tall. So everyone is encouraged to invest to have it.
- "C_f" is very small ("ΔA" fixed) : that is to say, the cost of obtaining this level by the less able is very low.

The other condition is that "$e^*_h > \Delta A/C_h$". In such a situation, individuals will not be encouraged to invest in order to obtain e^*_h, for the following reasons:

- "ΔA" is very small ("C_h" fixed): that is to say, the opportunities that bring such an investment are very low so that it is no longer profitable to invest.
- "C_h" is very tall ("ΔA" fixed): which advocates that the cost of achieving this level be very large, so that its achievement is no longer attractive even for the most able.

We notice that the educational signal is no longer operative for these two cases and we return to the standard salary "$w_0 = \mu_0 A_h + (1-\mu_0)A_f$". But, we also note that the loss from the poorest in the event of reporting equilibrium is:

$$\mu_0 A_h + (1-\mu_0)A_f - A_f = \mu_0 A_h - \mu_0 A_f = \mu_0 (A_h - A_f)$$

And the gains for the most suitable for this same report are:

$$\begin{aligned} A_h - C_h e_h - \mu_0 A_h - (1-\mu_0)A_f &= A_h(1-\mu_0) - A_f(1-\mu_0) - C_h e_h \\ &= (1-\mu_0)(A_h - A_f) - C_h e_h \end{aligned}$$

This gain is likely to be lower than the loss, so the signal equilibrium is socially inefficient because it decreases the general distributed income (Stiglitz 1975). A situation that is all the more embarrassing as the number of the most able is great.

The less able individuals are willing to pay a "p" premium in favor of the best fit so that they do not report themselves when the better-off realize that they have an interest in investing more, since their position is improved with this investment than to remain neutral.

Moreover:

$$A_h - C_h e_h \succ \mu_0 A_h + (1-\mu_0)A_f$$

$$\Rightarrow e_h \prec \frac{(1-\mu_0)\Delta A}{C_h}$$

$$\Rightarrow (1-\mu_0) \succ e_h \frac{C_h}{\Delta A}$$

We already know that:

$$e_h \succ \frac{\Delta A}{C_f} \Leftrightarrow (1-\mu_0)\frac{C_h}{\Delta A}\frac{\Delta A}{C_f}$$

$$\Rightarrow (1-\mu_0) \succ \frac{C_h}{C_f}$$

This inequality indicates that the gap between the costs of obtaining the "eh" level for the two categories of individuals is narrowed, the more the size of the group filtered for the diploma considered is inflated, the less able the benefit their educational efforts in relation to their untrained situation.

This analysis allows us to learn about the first sources of depreciation, which currently intensive unemployment that threatens especially the least trained, reduces their opportunity costs of continuing education. This lowering of costs (which may also be generated by other factors) leads to the dismantling of cost frontiers. Thus, the information balance will no longer be able to provide filtered (partially) individuals based on abilities.

The problem lies in this situation, where translating studies upwards destroys (in the long run) the ability of each level to filter the corresponding skills, thus reflecting productivity.

Finally, this last inequation shows that, the more the acquisition costs of the distinct levels become closer and closer for individuals of distinct aptitude, the higher the level of training which ensures a separating equilibrium, and the proportion filtered is weak.

In these conditions and in the current state, we find that the belief structure on the part of employers is changed where:

For $e < e^*$: $P(A_f) = 1 \quad et \quad w_f^* = A_f$

For $e \geq e^*$: $E^*(A) = w^*(e^*) = \mu_1 A_h + (1-\mu_1)A_f$ with $\mu_0 < \mu_1 < 1$

Such a transvestite belief structure that employers are not sure when recruiting that a trained individual "e^*" either aptitude "A_h". But below, they are sure to recruit a suitable individual "A_f". In other words, among the $(1-\mu_0)$ who are of poor ability there is a fraction $(1-\mu_1)$ who managed to report the level "e^*" under the conditions already analyzed. So their costs go from "C_f" à "c_f" avec "$c_f < C_f$", these less able agents are only willing to invest if this situation is in their favor, which augurs "$\alpha(1-\mu_0)$ " which is at the level "e^*" :

$$A_f < E^*(A) - c_f e^*$$

And the rest is to say "$(1-\alpha)(1-\mu_1)$" below "e^*" such as:

$$A_f \geq E^*(A) - c_f e^*$$

For individuals of the type "A_h" :

$$E^*(A)-C_h e^* > A_f$$

Because of this, "e^*" no longer guarantees a separating equilibrium, it simply makes it possible to limit the basic heterogeneity. However, employers are always encouraged to look for a signal that guarantees "$P(A_h) = 1$". Similarly, for the most able individuals who are always willing to pay in search of a "e^*" separator, beyond looking for the highest possible levels (which proved ineffective in the long run).

The company can search for these individuals using the types of pathways, or types of institutions, but assuming that the latter practice a more severe selection procedure, and initial aptitude screening is better than in other establishments or sectors (eg school and university), by checking the following conditions:

$C(E, e, A_h) < C(E, e, A_f)$ whatever "e"

$C(A_i)e_E^* \succ C(A_i)e_U^*$ Whatever $i = f, h$

And

$$C_E(A_f) - C_E(A_h) > C_U(A_f) - C_U(A_h)$$

This last condition means that it is more expensive to acquire the same level in schools than in a university, regardless of ability, and in return school leavers will be recruited at a salary:

$E^*(A) = w^*(e_E^*) = A_h$, the level "$e_E^*$" is considered a separating equilibrium.

So we will consider a proportion "μ_2" of "μ_0" who will continue their studies in schools and $(1 - \mu_2)$ in universities such as "$0 \leq \mu_2 < \mu_1 < 1$" (since some will continue their studies in schools). The conditional probability structure for companies is as follows:

For $e = 0$ $P(A_f) = 1$ and $w^*(0) = A_f$

for e = e^* $\begin{cases} e^* = e_U^* \Rightarrow E_U^*(A) = w^*(e_U^*) = \mu_2 A_h + (1-\mu_2)A_f \\ P(A_h) = 1 \quad et \quad w^*(e_U^*) = A_h \end{cases}$

This structure is only valid if:

$$\mu_2 A_h + (1-\mu_2)A_f - C_U(A_f)e_U^* \succ A_h - C_E(A_f)e_E^* \quad [1]$$

For A_f and part of A_h

And

$$A_h - C_E(A_h)e_E^* \succ \mu_2 A_h + (1-\mu_2)A_f - C_U(A_h)e_U^* \quad For\ A_h \qquad [2]$$

We have:

$$e_U^* = e_E^* = e^*$$

$$e^*\left[C_E(A_f) - C_U(A_f)\right] \succ (1-\mu_2)A_h - (1-\mu_2)A_f$$

[1] ➔ $$\Leftrightarrow e^* \succ \frac{(1-\mu_2)(A_h - A_f)}{C_E(A_f)C_U(A_f)}$$

$$A_h - \mu_2 A_h - (1-\mu_2)A_f \succ e^*\left[C_E(A_h) - C_U(A_h)\right]$$

[2] ➔ $$\Leftrightarrow e^* \prec \frac{(1-\mu_2)(A_h - A_f)}{C_E(A_h) - C_U(A_h)}$$

➔ $$\frac{(1-\mu_2)(A_h - A_f)}{C_E(A_f) - C_U(A_f)} \prec e^* \prec \frac{(1-\mu_2)(A_h - A_f)}{C_E(A_h) - C_U(A_h)}$$

This analysis illustrates that a second signal is needed beyond the training level to arrive at a separating equilibrium. But this modeling has some shortcomings:

- Assuming that "$\mu_2 < \mu_1$" risk of increasing the number of less able in the university, that is to say $(1- \mu_2)$. So, to increase the heterogeneity in this system and that in turn risks threatening once again the credibility of the second signal. In this perspective, the development of the second signal only trivializes the first and we will be in a more serious situation.

- The equilibrium is reached on quantities "e^*" without specification of " e_E^* and of e_U^* ".

3- *Frontier training and adequacy with the position occupied*:

Another current postulates that productivity is no longer just a joint product of skill, but also depends on the assignment of different aptitudes to suitable positions (which may open another way of selection). There are two types of positions: one that requires high skills and the other low skills, but full productivity is only achieved when there is fit between the position and the skill.

Whether "*Pij*" : the productivity of a capable individual « *i* » where *i = h, f* assigned to a position « *j* » where *j = h, f* and has as structure: "$P_{hh} > P_{ff} > P_{hf} = S$[3]" in such a way that only the problem of declassification of the most suitable individuals arises. The less able are always assigned to suitable positions, so the best fit always has an interest in signaling themselves by referring to the cost condition reported by Spence. In this configuration, the

[3] *P_{fh} cannot exist, because in the absence of all reports all individuals will be first assigned to positions of type f.*

economy is profitable thanks to this report, where in the absence of education the remuneration is:

$$E_0(P_{ij}) = \mu_0 S + (1 - \mu_0)P_{ff} = w_{0f}$$

We find that even the least able individuals have an interest in the best able to report themselves since:

$$P_{hh} > P_{ff} > w_{0f} > S.$$

For non-rationed heterogeneous jobs at rational equilibrium, productivity increases and wages rise to:

$$w^*(e^*) = \mu_0 P_{hh} + (1- \mu_0)P_{ff}$$

Provided that for A_f:

$$P_{hh} - C_f e^* < \mu_0 S + (1 - \mu_0)P_{ff}$$

And for A_h :

$$P_{hh} - C_h e^* > \mu_0 S + (1 - \mu_0)P_{ff} \quad [1]$$

And we can easily see that the less able generate a rent given this balance of:

$$P_{ff} - [\mu_0 S + (1- \mu_0)P_{ff}] = \mu_0[S + P_{ff}]$$

But since the latter are excluded from the investment process and their situation is appraised simply because of the investment of the most able, the constraint for them is transformed into:

$$P_{hh} - C_f e^* < P_{ff}$$

Under the same conditions, if there is a decrease in the continuation of studies "$C_f = C_h = U$", the equilibrium is not threatened, but this cost, according to [1], is within an amplitude range "$\mu_0(P_{ff} - S)$ ".

$$\Rightarrow P_{hh} - P_{ff} < C.e^* < P_{hh} - [\mu_0 S + (1 - \mu_0)P_{ff}]$$

However, it can be considered that this informational balance is no longer separating even if the less able refuse the investment. Moreover, maximizing total wealth implies that:

$$P_{hh} - C.e^* = P_{ff} \qquad \text{(Stiglitz } 1975\text{)}.$$

So, we will only have a fraction of the most able to invest in training. The use of other means for identification by companies may be through internships or contracts, but here the decision structure will be changed by taking this factor into consideration.

We will now see the case where jobs are rationed, assuming for example that "$\gamma_h < \gamma_f$" with "γ_i" indicates the proportion of employment « *i* » in the population where "$\gamma_h < \mu_0$" and then we will have the expectation of maximum productivity in the absence of a report:

$$\gamma_f[\mu_0 S + (1- \mu_0)P_{ff}] + \gamma_h [\mu_0 P_{hh}]$$

And in the case of separator reporting the maximum total productivity is:

$$\gamma_h P_{hh} + \gamma_f P_{ff}$$

This expression can provide the best productivity from optimal assignment allowance as necessary skills.

The real equilibrium in the presence of rationing is:

$$\gamma_h P_{hh} + \gamma_f[(1 - (\mu_0 - \gamma_h))P_{ff} + (\mu_0 - \gamma_h)S]$$

Thus, in these rationed employment conditions, the necessary "e *" level will be pushed as high as possible by the companies to reach a level of maximum degree of homogeneity.

One can also detect from this last equation that there are individuals who are doubted of the same level "e *", but their remuneration is different. This distinction finds full explanation in segmented market theory.

4- *Reexamination of the filter model*

a. *Model structuring:*

According to this model, each person is supposed to characterize by three positively correlated magnitudes: his / her pre-university skills (u), probability of success, and productivity (P).

With "u" is the conditional probability of success in higher education given the previous course. $E(P / u)$: is the expected productivity of increasing productivity with a probability of success at the university "u".

This construction of the hypothesis of positive filtering assumes that schooling extends to a minimum age, and that the labor market makes it possible to identify and recover the elites.

We call "u_0" the minimum level of access to the university and as "$u > u_0$", the productivity of an admitted individual "$E(P/u \geq u_0)$" is greater than the average productivity of the entire population "$\overline{P}$", but less than the productivity of young people who graduated, and who had a higher probability of success. These young graduates have productivity "$\overline{P_s}$", so we'll have:

$$\overline{P} < E(P/u \geq u_0) < \overline{P}_s.$$

The introduction of the cost variant will play a central role here.

The model assumes that the work is homogeneous, that is to say that the individuals are perfectly substitutable to each other, and this independently of their productive capacity. Replacing a highly productive individual with two others of average productivity can fulfill the mission. So productivity has no social value and "$E(P) = P$" ; in such a context, university degrees are perfectly sterile, leading to a divergence between social demand and private demand. The remuneration of graduates will depend on the expected value of their production.

The interest of this model is to privilege following Arrow the clause of "free entry".

b. *the implications of the model:*

A person can access higher education only with a cost (c), this presages that the clause of free entry does not imply free higher education. Arrow's explanation - so as not to be in contradiction with the principle of free entry - is that anyone can (even if he cannot afford it) continue his studies, provided that he is convinced to have a good chance of success. In other words, to judge whether it is profitable for him to continue and bear a cost "c" than to give up.

In accordance with the foregoing, on the one hand, candidates can be informed of their chances of success, but not of being qualified. On the other hand, employers are also fully aware of the productivity they can expect from a graduate and non-graduate candidate.

Similarly, "u_0", which is the critical level of university focus, may be in contradiction with the free entry clause which assumes a sufficient capacity to accept all candidates, so as to break this critical level.

Arrow's explanation assumes that the university system is sufficiently diversified to have sufficient capacity to accommodate.

c. *Presentation of the model:*

The presentation of the model imposes three stages:

From an employers' point of view, they pay graduates at one level:

"$\overline{P}_d = \overline{P}_d(u_0)$" and non-graduates at the level "$\overline{P}_n = \overline{P}_n(u_0)$", so that the average productivity of the whole population "$\overline{P}$" is:

$$\textbf{[1]}\ \overline{P} = \overline{P}_d(u_0).N_d + \overline{P}_n(u_0).(1 - N_d)$$

This implies:

$$\overline{P}_n < \overline{P}$$

"N_d" represents the proportion of graduates in the population and "$(1-N_d)$" are those who have no degree.

After entering university, the probability of success is "$\overline{u}_e$" and that of failure is $(1 - \overline{u}_e)$, and the candidate supports ~~in~~ both cases a cost "c". So, the expected gain for him if he decides to get away from these higher studies is:

$$\textbf{[2]}\ \overline{P}_d\,.\,\overline{u}_e + \overline{P}_n\,.\,(1 - \overline{u}_e) - c$$

And "$\overline{P}_n$" if he gives up.

In the absence of risk aversion, we will have equality between the two gains of the two possible strategies, so we have:

$$\textbf{[3]} \quad \overline{P_d} \,.\, \overline{u_e} + \overline{P_n} \,.\, (1 - \overline{u_e}) - c = \overline{P_n}$$

Hence:

$$\overline{P_d} \,.\, \overline{u_e} + \overline{P_n} - \overline{P_n} \,.\, \overline{u_e} - c = \overline{P_n}$$

Finally:

$$\textbf{[4]} \quad \overline{u_e}\,(\overline{P_d} - \overline{P_n}) = c$$

So we can write that:

$$\overline{P_d} > \overline{P_n}$$

According to **[1]** :

$$\overline{P_n} < \overline{P}$$

This shows that the bottom trap has increased, that is, the income of the non-graduates was lower before some decided to enter higher education. In addition, they do not benefit from filtering since their expected income is equal to that of non-graduates. Hence the Arrow principle for the abolition of the university (if it was simply a filter) is found to be verified, as long as the university shows no effectiveness, and that it can also provoke an income inequality that was not present before.

Such a process leads directly to the obligation to dismiss the university, but C. Gamel (2000) considers that this model produces little reality, and that it must be amended at least by two voices:

According to [4] we can write that:

$$\overline{P_d} - \overline{P_n} > c$$

Therefore:

$$\overline{P_d} - c > \overline{P_n}$$

Hence, only a total aversion to the risk that the gain "$\overline{P_n}$" remains below the gain "$\overline{P_d} - c$", thereby encouraging candidates who believe in them a great chance of success. But, it is difficult to admit that all the admitted candidates are mistaken about their own aptitude. In this case no one can succeed.

On the other hand, $(\overline{P_d} - c)$ is also greater than "$\overline{P}$" from (*1*), and according to the same reasoning Arrow, all individuals are not interested in continuing their academic studies.

Exceeding the "free entry" clause:

By evoking another principle than that of free entry, which is quota access, such a principle does not operate with a balance controlled by the access threshold "u_0", but with an imbalance

justified by the impossibility of the university system to accommodate all applicants, even if they are willing to pay their study cost. This means that candidates admitted to higher education do not have an interest in the abolition of the university, since their expectation of gain will necessarily be greater than those who could not access the university. , and equality [3] becomes an inequality.

But a dynamic study shows that Arrow's forecast is true, and the volume of public funding for higher education is magnified. But here, too, nothing is guaranteed for the free entry clause to be verified, because such a growth of public expenditure is mainly related to the increase of enrollments at the university. This decrease in real cost will tend to have "$c = 0$" following the evolution of the university system. Applying this result in the Arrow model, equation [4] becomes:

$$\overline{u_e}\,(\overline{P_d} - \overline{P_n}) = 0 \qquad \textbf{[5]}$$

Therefore:

$$\overline{u_e} = 0 \text{ ou } (\overline{P_d} - \overline{P_n}) = 0$$

Assuming the university has not changed its policy, and the probability "$\overline{u_e}$" to succeed remains the same, it remains for us to study that " $(\overline{P_d} - \overline{P_n}) = 0$"

n other words, the cost of higher education in the extreme becomes zero and each individual has an interest in continuing these studies since they cost him nothing, and the number of candidates becomes maximum. So, the average earnings of graduates and non-graduates become the same.

This result is no longer in accord with either "free entry" or "growing host capacities", and Arrow's prognosis is denied on this dynamic scale. This means that the risk of quota access to the university is exacerbated when one examines the problem in a dynamic way (which is necessary). We still have the other meaning that is on the one hand, the reduction of "u_0", on the other hand, the increase of the probability of success, and again the university system can only challenge the free entry clause and operate on a quota basis. Equation [4] becomes:

$$1\,.\,(\overline{P_d} - \overline{P_n}) = 0$$

Henceforth, the income gap between graduates and non-graduate candidates is disappearing and we will have:

$$\overline{P} = \overline{P_d} = \overline{P_n}.$$

So, the degree here will have no real meaning since it has lost on the one hand, any opportunity to benefit from a distinguished salary, and on the other hand, any signal capacity against unemployment.

The possible modalities for the university system to effectively fail this situation may be prescribed by adjusting the costs of studies (quantitative adjustment), and by merit (qualitative adjustment).

- The first is to stop the decline in the real costs of higher education (c), so as to make access to university less automatic. Agents who have an intellectual capacity, but not financial, must be subsidized by the state, but according to strict standards.
- The second is to strengthen the filtering function of universities. In one case, it is not enough to pay the costs of higher education to have a degree, but you must pass the filtering academic. A goal that can be achieved by increasing either "u_0" (the minimum level of access to university), or by decreasing the probability of success "$\overline{u_e}$" or both sets.

It's easy to notice that filtering options are getting cheaper; those who focus on access to university are much less expensive than those who hold more to success in higher education studies. But this difference can, on the other hand, reinforce the modalities of equal opportunities.

All in all, these reflections show how much it is necessary to regularize the university system with the market model.

Conclusion:

Individuals are considered as sources of competence, whose full valorization is possible only by the adequacy between the diploma and the employment held, where at each position one can find under-educated and educated ones.

It must be admitted that competence is a necessary mixture between diploma and experience (between the implicit and the explicit), and finds its full effectiveness only outside depreciation.

The extension of education presupposes an interaction between companies, young people and the state, which are still in conflict of interest. The study shows that in situations of imbalance, only the State is able to find ways of understanding.

In any case, the depreciation must be controlled, so that the diploma is not a main object to sanction a level of knowledge, but rather to reveal skills in a context of fundamental uncertainty about the quality of candidates for fattening. This challenge is only possible through economic recovery and a well-studied filtering system.

The study of the signs of depreciation manifested by the unemployment of the graduates, the declassification, the lengthening of the studies, the decrease of the educative returns, the loss of signal pushed our analysis towards the proposal of a model which is based on the market value of a diploma.

The analysis of this construction shows that the valorization of a diploma depends largely on the average aptitude, as well as the dispersion of the aptitudes within the people who holds this diploma.

This work should be deepened in several directions. In particular, consideration should be given to the possibility for groups to progress in the distribution of skills, which would make it possible to propose a dynamic approach instead of this static autopsy of the market value of diplomas, subsidiary to the present one study.

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