

The Joy of Working

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Abstract

Work is the main time consuming activity of individuals. Traditional Labor Economic theory has always considered work as a necessary *homogeneous* evil while more recent theoretical frameworks have also incorporated *non-pecuniary* factors to the *return* to work (being mainly focused in safety, working environment, etc). However, does anything else matter? *Ceteris Paribus*, is it the same for an animal-loving person to work as a butcher instead of being a veterinarian? This paper tries to incorporate other factors to the basic labor supply model, considering work as a *non-homogeneous bad* and exploring different practical consequences this approach may have.

Resumen

Los individuos pasan gran parte del día trabajando. La Economía Laboral tradicional ha considerado al trabajo como un mal *necesario* mientras que análisis más recientes han incorporado variables *no-pecuniarias* al *retorno* del trabajo (tales como seguridad, ambiente de trabajo, etc.). No obstante, ¿habrá otros factores relevantes? El presente trata de incorporar otras variables al modelo básico de oferta de empleo, considerando al trabajo un *mal* heterogéneo y explorando algunas extensiones prácticas que se desprenden de este enfoque.

JEL Codes [J2] [J3]

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I. Introduction

Ignoring differences in occupations may lead to thinking that the only variable of interest for individuals when deciding how much labor they supply and where they work is the wage they are paid. Is it all about *monetary* aspects (meaning characteristics that are directly or indirectly related to money) or are there *non-pecuniary* factors affecting the individual's decision process? Since Adam Smith, however, and his theory of equalizing wage differentials, it is acknowledged that job characteristics are also considered in the utility function of individuals.

In relation, it is useful to set the discussion in terms of the hedonic price theory elaborated by Rosen (1974). In his approach, each indivisible good is conformed by a set of characteristics which give utility to individuals, so when choosing consumption the individual is selecting a specific combination of these characteristics that maximize his utility subject to his (endowment) constraint. Analogously, when choosing a job, the individual would be taking into account different characteristics that provide him with utility, namely: wage, work environment, reputation, duties to be accomplished at work, etc.

Relative recent literature has emphasized the role *non-pecuniary* factors play in the labor market. This is the case of van Ophem (1991), who supports the idea that employees do care about *non-monetary* job characteristics when deciding whether to search for a new employment. Moffit (1983) explores the presence of *non-monetary* factors in assistance plans, incorporating the *stigma* cost of being assisted and verifying his theory empirically. Lucas (1977) has analyzed *psychic* factors in the return to schooling. He introduces several job characteristics in the utility function of individuals, and tests his model empirically. He finds that estimates of returns to schooling are downward biased when ignoring non-monetary rewards. In this sense, as higher education is generally more specific and much more related to preferences, it can be said that people could sacrifice monetary wage in exchange of doing the work they prefer.

We can classify *non-monetary* factors into *objective* and *subjective*, the first ones being those which all agents value positively (or negatively) and the latter ones supposed to be valued differently by individuals. That is, individuals will univocally enhance their satisfaction if safety is increased at their jobs, while some people will improve their utility if more responsibilities are assigned to them at work (those who consider it as challenge) and some others will be worse off if more duties are delegated to them (the ones who, for example, are routine *lovers*). Warner and Goldberg (1984) suggest that navy personnel do value positively shore duties relative to sea duties and the probability to be assigned to the former ones influences the decision on whether to reenlist or leave service. McCormick (1990) explores the case where people's satisfaction when (reluctance to) being assigned skilled work depends on their productivity (in this case, skilled work stands for a *subjective factor*).

We are to introduce the simplest model developed by Becker (1965), since our extension is based on this framework. Families derive utility from consumption and leisure and combine inputs (*i.e.* time and money) in order to maximize their satisfaction. Their restriction is therefore given by the total time available (T), which shall be allocated between leisure

consumption (S)¹ and labor supply (L), and by the fact that the sum of labor earnings and non-labor income (NLI) shall be equal to consumption (C).² These two restrictions can be combined in one as follows:

$$C + S * W = NLI + T * W \quad [1]$$

$W \equiv \text{market wage}$

The rationale behind this restriction is that the maximum endowment of resources is given by non-labor income and the labor income that would be obtained by working the whole available time (*potential* income). In turn, the opportunity cost of leisure is given by the market wage.

The reservation wage (RW) is defined as the minimum wage at which the individual decides to supply labor, as the following expression shows:

$$U(S^a, C^a) = U(S^b, C^b)$$

$$S^a \equiv T \text{ and } C^a \equiv NLI \quad [2]$$

$$S^b \equiv T - L^*(RW) \text{ and } C^b \equiv NLI + RW * L^*(RW)$$

Section II expands Becker's approach and section III investigates some applications our extension pops out. Section IV deals with the empirical testing of our model. Finally, section V concludes.

II. Model Extension

In the context of Becker's framework, our mission is to allow work to be a *non-homogeneous bad*, in the sense that the dissatisfaction job duties impart to a person can vary across different occupations. We are to explore the case in which *subjective* factors play a substantial role in the decision-making process so as to support the idea that a pet loving person would find more attractive to work as a vet rather than as a butcher (*ceteris paribus*).

Two ways of doing this arise, both of them thinking about an individual who faces multiple types of occupations in the labor market. One of them is to plot diverse indifference maps between different occupations. Hence, considering a two dimensional graph in which indifference curves are plot (describing the subsets of labor, *i.e.* hours, and consumption that provide the individual with the same level of utility), steeper indifference curves are to be drawn if the person faces a job he *dislikes* relatively to another occupation. If we *jump* from a combination of labor and consumption to another one with higher time spent at work and we want to keep the person's utility constant, the augment in his consumption must increase conformly the (*subjective*) aversion of the individual to the occupation analyzed enlarges. In relation, Lucas (1977) has already incorporated subjective factors to a hedonic utility function to derive labor supply.

¹ To keep this presentation simple, leisure is supposed to be homogeneous, that is all time outside job duties.

² The price of consumption is set at unity.

However, we find more tractable to affect the individual's constraint in the maximization problem according to his dislike to a job. The conventional restriction on the time the person has, to be allocated into labor and leisure, is modified. Obviously, time availability is not expanded, but a fraction of time spent at work is allowed to be considered by the individual as leisure.

Therefore, the *occupation dislike factor* (A_i) is introduced and the *new* restriction on time the individual faces is given by the following expression:

$$T = S + A_i * L$$

where $A_i \equiv$ *occupation dislike factor for occupation i* [3]

$$0 \leq A_i \leq 1$$

A_i can be assumed as the fraction of time spent at work that provides the individual with the same satisfaction as leisure does³ and increases conformly the (*subjective*) aversion of the person to the *ith* occupation augments.⁴ If we combine this time restriction with the consumption constraint, the single endowment constraint when considering *ith* occupation is given by:

$$C + S * \frac{W_i}{A_i} = NLI + T * \frac{W_i}{A_i} \quad [4]$$

This last equation shows that the *occupation dislike factor* plays the role of expanding the total endowment of the person (in the sense that leisure is not only time out of work) and enlarging the opportunity cost of leisure. Hence, the return to the *ith* occupation is composed not only by its wage but also by its associated degree of satisfaction, which magnifies the effect of the salary in the opportunity cost of being off job duties. The *hedonic wage* (HW_i) is to be defined and to become one of the variables of interest in the individual's maximization process:

$$HW_i = \frac{W_i}{A_i} \quad [5]$$

$HW_i \equiv$ *hedonic wage for occupation i*

The problem of the agent when facing *ith* occupation resides in maximizing his utility subject to the constraint⁵ described in equation [4]. Combining the first order conditions of the maximization process results in:

³ Recall that the conventional theory sets the *occupation dislike factor* equal to unity.

⁴ We could think of a way of reinforcing decreasing marginal utility of time spent at work (equation [3]) would also lead to decreasing marginal utility of working hours if the *objective function* is such that leisure has diminishing marginal returns). Hence, the *job dislike factor* might be included in the restriction as the following:

$$T = S + A_i^{(1-L/T)} * L$$

For simplicity, we consider the case where the *job dislike factor* does not depend on the time spent at job duties.

⁵ In the traditional framework, the individual faces the constraint establishing that labor is to be nonnegative, as well as the restriction described in equation [4]. Here, an additional restriction is imposed:

$$L \leq T$$

If this inequality were not determined, the individual would be able to choose a combination of labor and consumption that is not actually feasible since it does not satisfy the time availability limit. Therefore, the maximization process in our approach is subject to equation [4], labor being nonnegative and the last inequality.

$$\frac{\frac{\partial U}{\partial S}}{\frac{\partial U}{\partial C}} = \frac{W_i}{A_i} = HW_i \quad [6]$$

So, the individual allocates his time at work so as to equate the ratio of marginal utilities of leisure and consumption to the hedonic wage. Labor supply based on a traditional utility function as $U(S, C) = S^\alpha * C^{1-\alpha}$ is given by:⁶

$$L_i^* = \frac{(1-\alpha)*T}{A_i} - \frac{\alpha * NLI}{W_i} \quad [7]$$

The reservation wage of *ith* occupation can be approached by the following equation:

$$W_i^{RW} = \frac{\alpha * NLI * A_i}{(1-\alpha) * T} \quad [8]$$

$W_i^{RW} \equiv \text{reservation wage for occupation } i$

Hence, as expected, labor supply for the *ith* occupation follows a negative relation with the *occupation dislike factor* while the reservation wage for the *ith* occupation enlarges as the *occupation dislike factor* augments. That is, our pet-loving fellow would require a higher wage so as to work as a butcher than what he requires to become a veterinarian. As well, if the salary paid to a butcher were the same as the one earned by a vet (both of them being above their respective reservation wages), the animal-loving person would be willing to work a higher number of hours if his occupation were the latter one.⁷

III. Theoretical applications

Our extension of the basic framework permits to introduce the *job change reservation wage*, defined as the minimum wage required by an individual to change his occupation. Notice that in the traditional framework, where work is supposed to be homogeneous, this concept does not make much sense for an individual would always be eager to change his job if he is offered a greater salary. In order to explore the mentioned idea, we could work with the indirect utility function and differentiate it so as to find the required change in the monetary wage that keeps an individual shifting from occupation (a) to occupation (b) indifferent:

However, for analytical purposes, we are to *ignore* corner solutions and consider those cases in which the constraints that apply on labor are redundant.

⁶ Calculations shown are all based in this utility function.

⁷ Recall that the *occupation dislike factor* is merely *subjective*. A great portion of the time spent working as a teacher will stand for leisure for somebody who enjoys interacting with children while no time at work will be valued positively for somebody who is averse to relating to kids.

$$\begin{aligned}
& U(L^*(A_i, W_i)) \\
& dU = \frac{\partial U}{\partial L^*} * \frac{\partial L^*}{\partial A_i} * dA_i + \frac{\partial U}{\partial L^*} * \frac{\partial L^*}{\partial W_i} * dW_i \\
& \frac{dW_i}{dA_i} = - \frac{\frac{\partial L^*}{\partial A_i}}{\frac{\partial L^*}{\partial W_i}} = \beta > 0 \quad [9] \\
& \beta \equiv \left(\frac{W_i}{A_i} \right)^2 * \frac{(1-\alpha) * T}{\alpha * NLI} \text{ (in the Cobb - Douglas case)}
\end{aligned}$$

Imagine that occupation (b) is not as pleasant for the agent as occupation (a) is. Then, the *job dislike factor* of the former job is greater than that one associated to the latter one, leading to a rise in the salary required for the agent to shift occupations of (at least) the multiplication of β and the differential in the *job dislike factor*. Conversely, if occupation (b) is related to a lower *job dislike factor*, the individual would sacrifice at most the multiplication of β and the differential in the *job dislike factor* so as to change jobs and enhance his utility. Therefore, our theory assumes that money can provide *happiness* in the same sense as job characteristics⁸ do and, consequently, individuals can make a trade-off in these two *rewards* so as to maximize utility.

In this partial equilibrium context, the last equation conveys that an individual is better off if he sacrifices monetary income and works in what he likes relatively. Hence, the way of testing our extension immediately pops out: those ones who work in what they relatively *enjoy* earn less than those ones whose job is relatively unpleasant.

Some literature which tries to explain wage differentials is to be remarked. Gronau (1974) considers search strategies affect salaries. As search strategies can be assumed to be related to preferences, the latter consequently influence the individual's market wage perspectives and thus generate wage differentials. As well as this, Sen's (1999) approach is to be highlighted and linked to ours. We may consider both monetary wage and job characteristics as *functionings* that provide utility to individuals. Therefore, focusing exclusively on monetary income to measure wage differentials could lead to erroneous conclusions as inequalities should be analyzed at the level of *capabilities* (i.e. abilities to generate *functionings*).

What is more, our framework could be adapted so as to study the impact of *objective* factors in the labor market. People could become more comfortable at their jobs as *time goes by*; working in the same place for a long time could let an individual familiarize with his partners and incorporate habits that allow him to work under less stress. Therefore, *the job dislike factor* would be a decreasing function of the time the person has been related to his current occupation. Work-experience would consequently augment the individual's utility and also affect his *job change reservation wage*. In this way the theory may take into account aspects that arise as the time spent in an occupation enlarges.⁹

Likewise, the *status* associated with occupations might also be taken into consideration. As we take a look at the labor market, occupations differ in the way they are seen by people. For

⁸ For a complete discussion about the relationship of money and happiness, see Frey and Slutzer (2002).

⁹ Negative factors, such as routine, may be incorporated in an analogous way.

sure, the way society deals with a doctor is considerably dissimilar to people's attitude towards an economist. This *objective* factor (in the sense that people univocally like increasing their reputation) may be added to the analysis by a positive monotonous transformation (which should vary across professions) of the utility function, which does not alter the agent's *optimum* in a specific occupation but has incidence in the *job change reservation wage*.¹⁰

IV. Empirical evaluation

Although the main objective of this paper is to present the theoretical framework, we are to present a rough way of evaluating the theory elaborated. The dataset used in this study is from the Encuesta Permanente de Hogares (EPH) which is performed by the INDEC¹¹ together with the provincial statistics agencies.

The estimation is based on the following idea: someone who is working in what he relatively likes must be earning a greater salary than somebody whose job is relatively unattractive (to him). Based on the information regarding what a person has studied, we can get a *proxy* of how he ranks different occupations (*i.e.* we think that somebody who has studied veterinary owns a lower *job dislike factor* for working as a vet than for working as a butcher).¹² Therefore, according to what outlines section III, a person whose job matches what he has studied is to be paid less (*ceteris paribus*).

The *matching* was performed by comparing the answers to question P20 ("What is your occupation and what kind of task do you perform at your job?") and question P57 (What are your studies?). P20 is encoded according to the Clasificador Nacional de Ocupaciones¹³ and provides information discriminated in 10 activity sectors, each of them divided in 10 job descriptions (accounting for a total of 100 different job types). P57 is not encoded.

Based on the information provided by the EPH, we construct the variable "sub" which tries to capture whether a person is relatively interested in the kind of job he does. Accordingly, the variable "sub" can take the following values:

- 1:** When the current occupation matches the study area of the individual.
- 0:** Otherwise

Answer to question P57 is mostly available for individuals with *higher* education (with an education achievement greater than secondary education). Answer to P20 is only available for occupied persons. Thus, we created a sub sample from the EPH with observations for occupied males with complete higher education.

The model is based in the simple *Mincer* equation:¹⁴

¹⁰ An example is:

$$U_i = B_i * U(L^*(W_i, A_i))$$

$B_i \equiv$ status parameter of occupation i (identical to all agents)

¹¹ The INDEC is the Official Institute of Statistics of Argentina.

¹² Notice that we are assuming that people can *freely* choose what to study and, hence, we suppose that they are going to study what they *like* most.

¹³ We used the Clasificador Nacional de Ocupaciones version 1998 published by the INDEC.

¹⁴ The error term is assumed to have zero mean and constant variance.

$$\ln(w_i) = \alpha + \beta * X_i + Sub_i + \varepsilon_i$$

$w_i \equiv$ wage per hour
 $X_i \equiv$ socio demographic characteristics [11]
 $\varepsilon_i \equiv$ error term

According to our theory, the coefficient of the variable “sub” should be negative, showing that individuals that work in the field they relatively like earn less than individuals that perform tasks they do not find relatively pleasant.

Although the OLS estimation¹⁵ of the coefficients of the model shows that the variable “sub” is not significant, it should not imply that our extension does not apply. Our estimation faces both data quality and methodological difficulties.¹⁶

Data quality is a problem in the sense that the matching between occupations as classified by the CNO and education fields is quite *discretionary*. Even assuming that people’s studies are such that they reflect their preferences towards an activity, categories of the CNO used in the EPH are not precise enough to generate appropriate *links* (i.e. a doctor might be working in a hospital as a finance director and we would *erroneously* set “sub” to unity for this observation). As well as this, our assumption concerning that education reflects preferences might be unfortunate for people’s preferences could have changed *as time went by* and what they relatively liked doing in their youth (when they studied) may be substantially different from what they are now relatively attracted to.

Another reason for the non-significance of the sub variable is that it may be capturing two contradictory effects. On the one hand, it should denote the relation between preferences and job performed, which may lead to a lower wage bid by the individuals. On the other hand, it contains information regarding specific education in the field of work, thus increasing productivity and wages. Correspondingly, Lucas (1977) finds that specific vocational training *ceteris paribus* increases wages of individuals.

Regarding methodology, Thurrow (1978) argues about the difficulty of measuring *psychic* job returns by using traditional *Mincer* equations. He claims that wages may be positively correlated with *psychic* income, as the interaction of supply and demand might result in low wages for relatively unpleasant occupations.

V. Conclusion

Our extension contributes to explain some intuitive features of the job market. Money matters, but it is not all about money. Therefore, when analyzing people’s decision making process and their welfare, other aspects rather than what they are paid are to be considered. What is more, *subjective* aspects are to be outlined. A plausible extension could be to incorporate these factors in a general equilibrium context and study how wages are determined. For example, what would be the effect of augmenting (reducing) the heterogeneity of the *job dislike factor* across individuals on wages, hours worked, etc.?

As regards empirical examination, we consider that the results obtained in the present work ought not to discourage further research. Methodologically, it may prove useful to test the model in a dynamic perspective. Individuals’ performance in the labor market may be traced

¹⁵ The results of the OLS estimation are depicted in Annex I.

¹⁶ We acknowledged these problems before doing the estimation. However, we consider it is a fair try to give the core of our work (the model itself) some empirical evaluation that could guide us for further research.

through time and, hence, the study of the factors involved in the decision process of changing job types could gain in accuracy. Alternatively, and following Thurrow (1978) analysis, both demand and supply functions for each job type should be modeled to reach estimates of *psychic* rewards.

Data quality improvements can be also made. The matching between people's preferences and their job characteristics can be approximated in other ways. Information about their *hobbies* and habits may provide a better hint of the actual individuals' preferences, having the advantage of not being correlated with specific training that may have led to an increase in productivity. Regarding job characteristics, a better desegregation would be of great help.

Back to our framework, recall that the *pet-loving* fellow can be better off working as a vet rather than in a supermarket, even if his salary as a vet were lower than what he could earn as a butcher. Conversely, would the supermarket be able to hire the *animal-lover* even if he were offered a higher wage, a safer place to work and a better environment?

References

- Becker, Gary (1965); "A Theory of the Allocation of Time," *The Economic Journal*, September, 493-517.
- Frey Bruno S., Stutzer Alois (2002); "What Can Economists Learn from Happiness Research?," *Journal of Economic Literature*, Vol. 40, June, 402-435.
- Gronau, Reuben (1974); "Wage Comparisons--A Selectivity Bias" *The Journal of Political Economy*, Vol. 82, 1119-1143.
- Krueger A. and Summers L. (1988); "Efficiency Wages and the Inter-Industry Wage Structure," *Econometrica*, 56, 259-293.
- Lucas, Robert (1977); "Hedonic Wage Equations and Psychic Wages in the Return to Schooling," *The American Economic Review*, September, 549-558.
- McCormick, Barry (1990); "A Theory of Signalling During Job Search, Employment Efficiency, and Stigmatised Jobs," *The Review of Economic studies*, April, 299-313.
- Moffit, Robert (1983); "An Economic Model of Welfare Stigma," *American Economic Review*, 1023-1035.
- Oswald Andrew J. (1997); "Controversy: Economics and Happiness. Happiness and Economic Performance," *The Economic Journal*, Vol. 107, November, 1815-1831.
- Rosen, Sherwin (1974); "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," *Journal of Political Economy*, 82, 34-55.
- Thurow, Lester C. (1978); "Quality of Working Life. Psychic Income: Useful or Useless?," *The American Economic Review*, Vol. 68, 142-145.
- Sen, Amartya (1999); "Development as Freedom," Spanish Edition, Editorial Planeta, 2000.
- Van Ophem, Hans (1991); "Wages, Nonwage Job Characteristics and the Search Behavior of Employees," *The Review of Economics and Statistics*, February, 145-151.
- Warner, John, and Matthew Goldberg (1984); "The Influence of Non-Pecuniary Factors on Labor Supply: The Case of Navy Enlisted Personnel," *The Review of Economics and Statistics*, February, 26-35.

Annex I

For the estimation, as explained in the body, we generated the variable “sub” for all employed men with higher education in the EPH survey performed in October 1998 for which answers to both question P20 and P57 were available.

The OLS Regression for the logarithm of the hourly wage of individuals is presented in the following table. Our variable of interest (“sub”) shows to be non-significant at the ordinary significance levels. The control variables included in the regression refer to geographical placement (1 if the person lives in the mentioned area), informality (1 if the person is employed in the informal market), job skills (1 if applies), age and job tenure. Note nor education nor sex is included as control variables as there is no variability on these characteristics in the sample. All control variables have the usual signs predicted by the wage theory.

lw	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
sub	0.078	0.050	1.54	12%	-0.021 0.176
Job Tenure	0.000	0.000	0.3	77%	0.000 0.001
Age	0.023	0.003	7.81	0%	0.017 0.029
region GBA	-0.044	0.085	-0.52	60%	-0.212 0.123
region NOA	-0.545	0.085	-6.44	0%	-0.711 -0.379
region NEA	-0.594	0.093	-6.41	0%	-0.776 -0.412
region Cuyo	-0.602	0.089	-6.77	0%	-0.777 -0.428
region Pampeana	-0.514	0.076	-6.74	0%	-0.663 -0.364
informal job	-1.055	0.139	-7.58	0%	-1.328 -0.782
Semi skilled work type	-0.392	0.072	-5.46	0%	-0.533 -0.251
Unskilled work type	-0.676	0.157	-4.31	0%	-0.983 -0.368
_cons	1.309	0.126	10.41	0%	1.062 1.555
R-squared	0.332				
Number of observations	761				