



Interciencia

ISSN: 0378-1844

interciencia@ivic.ve

Asociación Interciencia

Venezuela

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Female discrimination at the professional level in Chile
Interciencia, vol. 36, núm. 11, noviembre, 2011, pp. 823-830
Asociación Interciencia
Caracas, Venezuela

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FEMALE DISCRIMINATION AT THE PROFESSIONAL LEVEL IN CHILE

PATRICIO MELLER, GONZALO VALDÉS
and BERNARDO LARA

SUMMARY

This work examines the role played by women in the labor market pertaining to Chilean university professionals. Over the last century the role of women has changed paradigm, from zero or low levels of participation to a generalized participation. This article analyzes the different stages of such participation and the current wage differential between men and women

is estimated. For two cohorts of these professionals the wage gap is estimated using a new data base which allows to control variables such as personal characteristics, skills (via the use of university entrance point scores) and socioeconomic influence. The results indicate a gender wage differential of around 23%.

At the beginning of the 20th century two connected prejudices existed in Chile: 'university is not for women' and, if women did attend, they ought to study 'careers for women'. The focus of this article is the discrimination observed in university professions and the changes that have occurred with regard to this anti-feminist segregation over time, throughout the 20th century and up to the present.

In Latin American countries, a university profession has a high social status: it increases labor options and provides greater autonomy. Given the persistent and considerable inequality in Latin America, a university profession constitutes the main mechanism for social mobility.

There is extensive literature that examines and analyzes the discrimination experienced by women in the labor market (Blinder, 1973; Blau and

Kahn, 2000). However, the study of how that discrimination has evolved in university professions is more limited; this focus enables a clearer perception and deeper examination of the progressive steps in the incorporation of women into the labor market.

In general, the negative segregation experienced by women in the labor market is associated with two different variables: i) access to certain types of employment; and ii) wage differentials. The existence of a diversity of university careers has the advantage of allowing to examine more deeply the role played by these variables.

Women's access to Chilean university professions is a process that evolved over the last one hundred years and which can be divided into four stages. In the first stage, at the beginning of the 20th century, women had restricted access to the university and were clearly segregated. At the beginning of the 20th

century Chile had just over 15000 university professionals, of whom 26.6% were women. This percentage would appear to refute the first of the prejudices mentioned above, i.e. that 'university is not for women'. However, 99.5% of the professional women were teachers ('a career for women'). Consequently, of all the Chilean professionals outside from teaching, only 20 were women, i.e. less than 2% of all the university professionals (Table I).

In the second stage, a little after the first half of the 20th century, the first of the prejudices mentioned practically disappeared: the participation of women had increased considerably, reaching almost 50% of the total stock of professionals. Nonetheless, women continued to be concentrated in certain highly feminized professions; teachers and nurses (and midwives) represented almost 94% of the total of professional women (Table I).

KEYWORDS / Chile / Discrimination / Gender / Higher Education / Labour Market / Wage Gap /

Received: 07/04/2010. Modified: 11/09/2011. Accepted: 11/10/2011.

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In the third stage, towards the end of the 20th century, the second of the above prejudices disappeared: there was a significant participation by women in almost all of the university professions. Once women had accessed all university careers, the fourth stage begins, already in the 21st century, when there is a wage differential for men and women in the same profession.

In the next section, a more detailed consideration is given to what occurred at each stage. The descriptions of the three first stages in the 20th century have the main aim of providing a brief historical preamble. Our main interest is focused on the fourth stage, which is the current situation, where the problem is one of the size of the difference between the salaries of professional men and women.

Historical Perspective

First half of the 20th century: few professional women

As described above, in the first stage (1907-1940), the participation of women in university professions was relatively low, and concentrated almost exclusively in Education and Nursing. Although the growth in the number of professional women is considerable during this period, they remained mostly segregated in the mentioned careers; nonetheless, the presence of women in Chemistry and Pharmacy began to increase, reaching over 30% of the total (of all chemists and pharmacists) by the 1930s (Table II).

The university professions with higher labor and social status in Chile during a large part of the 20th century were Law, Medicine and Engineering. In 1940, the participation of women in these careers was: Law 6.0%, Medicine and Dentistry 13.4% (presumably most of this percentage corresponded to Dentistry; it is not possible to separate the figures for Medicine and Dentistry in the information published by the *Instituto Nacional de Estadística-INE-* in the population census), and Architecture and Engineering 1.5%. Again, it is not possible to separate the figures for Architecture and Engineering in the available INE information.

TABLE I
DISTRIBUTION OF WOMEN ON SELECTED UNIVERSITY CAREERS

	1907		1960		1992	
	N	%	N	%	N	%
Agronomy and Veterinary Science	0	0.0	65	0.1	1143	0.9
Chemistry and Pharmacy	0	0.0	1221	2.3	2042	1.7
Law	3	0.1	498	1.0	3108	2.6
Architecture and Engineering	0	0.0	354	0.7	6077	5.0
Medicine and Dentistry	17	0.4	1173	2.2	6707	5.6
Nursing and Midwifery	0	0.0	17780	34.0	11272	9.4
Education *	3980	99.5	31194	59.7	90128	74.8
Total women	4000	100.0	52285	100.0	120477	100.0
University professional women with respect to total number of professionals	26.6%		49.6%		49.6%	

* Courses in Education originally lasted three years. Source: INE.

TABLE II
FEMALE PARTICIPATION IN THE LABOR MARKET FOR SELECTED GROUPED CAREERS. 1907-1940

	1907	1920	1930	1940
	%			
Architecture and Engineering	0.0	0.0	0.3	1.5
Law	0.2	0.7	2.3	6.0
Agronomy and Veterinary Science	0.0	0.0	1.3	7.2
Medicine and Dentistry	1.2	6.3	8.1	13.4
Chemistry and Pharmacy	0.0	10.3	38.1	30.9
Education	50.1	65.0	69.4	69.3
Nursing	0.0	61.2	83.5	87.0

Source: INE.

TABLE III
FEMALE PARTICIPATION IN THE LABOR MARKET FOR SELECTED GROUPED CAREERS. 1960-1992

	1960	1970	1982	1992
	%			
Architecture and Engineering	2.1	3.8	6.8	13.5
Agronomy and Veterinary Science	3.2	5.8	11.1	16.7
Law	10.3	13.8	22.1	25.8
Medicine and Dentistry	18.0	21.3	28.6	34.1
Chemistry and Pharmacy	39.0	40.5	46.0	49.3
Education	65.2	62.6	66.2	67.6
Nursing	80.3	82.1	85.5	93.1

Source: INE.

1960-1990: more professional women in more careers

Throughout the period corresponding to the second stage (1960-1990), an increasing number of women participated across all professional university careers. However, this participation was mostly prevalent in highly feminized university professions, such as Education

and Nursing (and Midwifery) where women represented 67%. Moreover, among all women in university professions, women in Education and Nursing (and Midwifery) represented >90%. In a third area, Chemistry and Pharmacy, the participation of women reached a level similar to that of men.

In the three high status university professions, Medicine, Law and Engineering, a gradually increasing female participation can be noted throughout this 30-year period (Table III). At the end of the period, women represented >30% of participants in Medicine and Dentistry (presumably most corresponded to Dentistry), a quarter of lawyers and <15% of architects and engineers.

In brief, it has taken a large part of the 20th century for there to be a significant percentage of female professionals who are doctors, lawyers and engineers (Figure 1). It is noteworthy that the relative participation of women in Education and Nursing remains fairly high and stable (Figure 2).

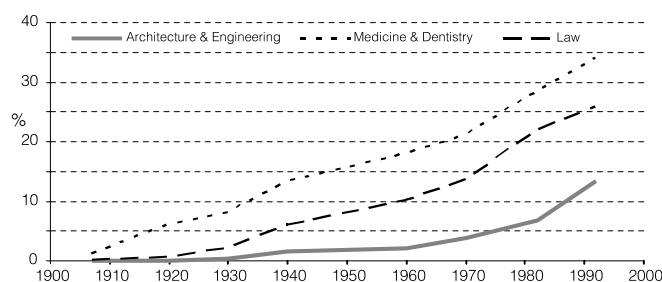


Figure 1. Evolution of female participation in Engineering, Medicine and Law. Source: INE.

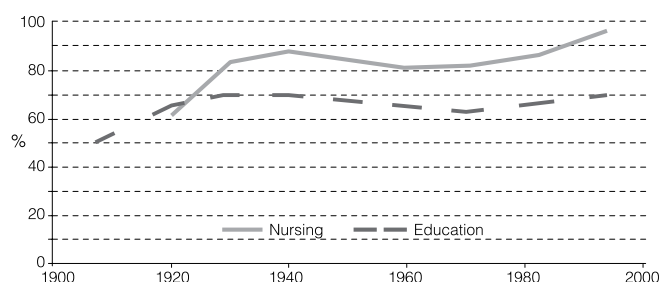


Figure 2. Evolution of female participation in Nursing and Education. Source: INE.

End of 20th century: significant female presence in all university professions

The final decade of the 20th century saw a large increase in university enrollment (a more in-depth analysis of Chilean university evolution and expansion can be found in Brunner and Meller, 2003). A predictable consequence was a significant increase in the number of professional women. The numbers involved can be illustrated as follows: in 1907 the total number of professional women was 4000 (Table I); in the year 2000, 8790 graduated (Table IV). In other words, in a single year the number of female students that graduated was more than double the total number of professional women there had been in Chile a century before. From the point of view of methodology, it is important to note that for the first two stages of stock variables (total of professionals) have been used to measure the participation of different professionals in the labor market. In the third stage of the participation of women in the labor market, flow variables (annual graduates) were used. On a similar note, 18728 professional women graduated in 2006 (Table IV), a number that is equivalent to 35% of all professional women in the country in 1960 (Table I).

In addition, it can be seen (Table IV) that in the 21st century the number of female university professionals that graduated was higher than the number of male university professionals that graduated each year. Women comprised 52.1%

and 59.6% of all the university professionals that graduated annually in 2000 and 2006 respectively.

It is no longer fitting to talk of there being only a couple of highly feminized university professions. In each of the 17 main university careers, the relative importance of women that graduate yearly

during the 21st century is markedly high (Table IV): i) in ten of the careers the annual percentage of new female professionals is >50%; ii) in the seven remaining careers, with the sole exception of Engineering, women comprise more than 30% of the new university professionals; iii) in Medicine and Law, two of the careers with the highest social status, new female professionals comprise >45% of the total number of new professionals that graduate annually.

Engineering has traditionally been considered a profession that is 'only for men'. The female presence in this career is evidence that nowadays there is no university profes-

sion that women cannot access, and it would even seem that recently Engineering has become particularly more attractive to women. The number of female engineers that graduate annually has doubled in the brief space of six years: in 2000 and 2006, 455 and 903 female engineers graduated respectively (Table V). Of the new women professionals ~47% specialize in Industrial Engineering, also known as Management Science or Operations Research, and supposedly the 'softest' of the different types of Engineering. Nonetheless, there is an increasing number of women professionals in the other, 'harder' specialties, such as Mining, Electrical and Mechanical Engineering. In brief, women have now 'invaded' all of the university professions.

When considering the careers from which women graduate annually, the following can be noted for the year 2000 (Table IV): i) by far the most common profession is that of Education, with female teachers representing ~23% of the total number of professional women; ii) this is followed by Business Administration (10.9% of the total) and Accounting (8%); iii) there are then various other university professionals: psychologists, nurses and journalists.

TABLE IV
DISTRIBUTION OF WOMEN IN SELECTED UNIVERSITY PROFESSIONAL CAREERS

University professional career	2000			2006		
	N° of women	% women in the career	% women in the career out of the total number of women on professional careers	N° of women	% women in the career	% women in the career out of the total number of women in professional careers
Teaching	1996	76.8	22.7	6432	78.2	34.3
Commercial Engineering	961	43.0	10.9	1283	45.5	6.9
Accounting	703	50.0	8.0	926	56.7	4.9
Psychology	581	71.9	6.6	1468	73.5	7.8
Engineering	522	19.6	5.9	1084	25.8	5.8
Journalism	477	61.5	5.4	649	59.7	3.5
Nursing	470	94.2	5.3	833	86.6	4.4
Social work	410	88.4	4.7	944	87.7	5.0
Law	375	42.6	4.3	622	47.3	3.3
Medicine	261	42.4	3.0	331	44.7	1.8
Architecture	206	39.0	2.3	419	41.7	2.2
Agronomy	155	34.3	1.8	264	41.5	1.4
Midwifery	138	88.5	1.6	327	86.7	1.7
Dentistry	116	56.0	1.3	189	51.8	1.0
Veterinary	93	49.2	1.1	225	56.4	1.2
Chemistry and Pharmacy	92	60.1	1.0	205	56.9	1.1
Educational Psychology	20	87.0	0.2	110	96.5	0.6
Other Professions	1214	55.2	13.8	2417	58.9	12.9
Total women	8790	52.1	100.0	18728	59.6	100.0
Women on professional university careers out of the total number of students			52.1%			59.6%

Elaborated with data from www.futuro laboral.cl database. 2000 and 2006 cohorts.

TABLE V
DISTRIBUTION OF WOMEN IN VARIOUS ENGINEERING CAREERS

	2000			2006		
	N° of women	% women in the career	% women in the career out of the total number of women in professional careers	N° of women	% women in the career	% women in the career out of the total number of women in professional careers
Industrial Engineering	212	20.1	46.6	436	27.4	48.3
Food Engineering	64	67.4	14.1	117	70.5	13.0
Civil Engineering	41	16.0	9.0	85	20.8	9.4
Forest Engineering	38	18.7	8.4	80	36.4	8.9
Computer Engineering	54	28.7	11.9	51	17.0	5.6
Chemical Engineering	21	25.3	4.6	43	47.8	4.8
Public Works Engineering	9	14.3	2.0	39	26.7	4.3
Mechanical Engineering	7	4.3	1.5	19	6.8	2.1
Electrical Engineering	5	3.1	1.1	14	9.2	1.6
Mining Engineering	0	0.0	0.0	10	15.4	1.1
Total Women	455 ^a	19.0	100.0	903	25.2	100.0
Women in Engineering out of the total number of Engineering students	19.0%			25.2%		

Some Engineering specialties have been excluded. Elaborated with data from www.futuro.laboral.cl database.

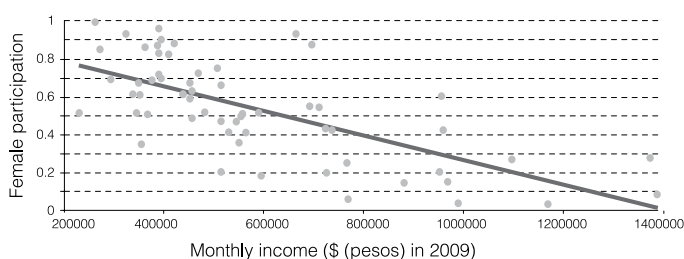


Figure 3: Relationship between female labor force participation (in a career) and (median) income for sixty university careers. Cohorts 2000-2001. Elaborated with data from www.futuro.laboral.cl database.

Income from Professional Careers and Female Participation

In the first three stages the role played by women in the labor market for university professionals has been illustrated. It has been shown that it

is no longer germane to question female access to university careers at present. Instead, the current issue is the existence of wage differences between male and female professionals sharing a given specialty. There are many myths about the existence of wage discrimination against women, and in order to consider whether there is any truth behind them, the wages of similar professionals must be compared, enabling a more adequate examination and empirical verification of the existence and magnitude of any gender-based wage gap.

TABLE VI
REGRESSION ANALYSIS OF DIFFERENT CAREERS FOR THE 1998 AND 2000 COHORTS (2ND YEAR AFTER GRADUATION)

ln_y	1998 cohort (N= 4349)		2000 cohort (N= 6517)	
	Coeff.	Std. Err.	Coeff.	Std. Err.
Female dummy	-.2297**	.0206	-.2218**	.0164
Female participation dummy	-.1118**	.0261	-.0590*	.0273
Duration	.2052**	.0141	.1826**	.0114
Age	.0475	.1580	-.1816	.1194
Age squared	-.0005	.0029	.0035	.0021
ln_PAA	.7876**	.0916	.8575**	.0692
Percent_FS	.3966**	.0507	.1931**	.0386
Metropolitan dummy	.1152**	.0210	.1063**	.0172
Constant	6.2510**	2.2642	9.2255**	1.7092

* significant at 5%. **significant at 1%.

PAA: average point score obtained in the university entrance exam, FS: fee-paying high schools. Elaborated with data from www.futuro.laboral.cl database.

There is a great variance in the salaries of Chilean university professionals. This can be clearly appreciated at www.futuro.laboral.cl a website that provides information about salaries for 60 university professional careers.

An initial analysis of the issue of the differences in salaries between male and female professionals involves examining the correlation that exists between the income median (the value corresponding to the person who is in the middle of all observations, or 50th percentile) of each of these 60 careers and the percentage of women there are in each profession. The Spearman's correlation coefficient has a value of -0.671, which is statistically significant at the 1% level. A similar result is obtained from Kendall's correlation (ranking correlation), which gives a value of -0.492, significant at 1%. This negative association shows that the higher the percentage of women in a profession, the lower the median salary for that career. This is shown in Figure 3 (see also Table VII).

The professions with a high female participation, those in which women represent >85% of the professionals, are (Table VII): Kindergarten Education (100%), Educational Psychology (93%), Nursing (93%), Midwifery (90%), Social Work (87%) and Primary Education (86%). These professions occupy the following places in the income ranking of the 60 university careers ordered from higher to lower (medium) income (Table VII, where higher numbers indicate lower income): Kindergarten Education 59, Educational Psychology 56, Nursing 19, Midwifery 43, Social Work 47, and Primary Education 50.

The evidence above raises the following questions: Is it possible that the greater female labor supply in these areas causes a pressure to reduce the salaries for these professions? On a different note, why do women tend to 'prefer' or 'choose' those university professions with relatively low incomes? Are women more inflexible (indifferent) to the money issue, attributing greater importance to motivational preferences?

Calculating the difference in monthly salaries between male and female professionals for the 1998 cohort of university graduates (from the 2nd

TABLE VII
PERCENTAGE OF WOMEN ON UNIVERSITY PROFESSIONAL CAREERS
AND MEDIAN INCOME FOR 60 UNIVERSITY PROFESSIONAL CAREERS.
2000-2001 COHORTS

University professional careers	% Women in the career	Median income for the profession (monthly \$ -2009)	Ranking according to income (highest to lowest)*
Kindergarten Education	99.8	261356	59
Differential Education	96.2	388163	46
Educational Psychology	93.4	322390	56
Nursing	93.3	664528	19
Midwifery	90.0	393003	43
Nutrition	88.2	419976	40
Phonoaudiology	88.0	695285	17
Social Work	86.8	385748	47
Primary Education	86.4	360963	50
Translation and Interpretation	85.2	270667	58
Language Education	83.3	389233	44
Public Relations	82.6	407652	41
Librarianship	75.0	505876	32
Psychology	72.6	468067	34
Science Education	71.7	388252	45
Design	69.7	393515	42
Drama	69.3	291740	57
Spanish Language Education	68.7	375476	48
History	67.9	350283	53
Religious Education	67.3	451250	37
Mathematical Education	66.9	513833	30
Occupational Physiotherapy	66.2	514223	29
Food Engineer	63.4	456146	36
Journalism	61.9	437722	39
Art, Music and Dance Education	61.6	337453	55
Art	61.0	351997	52
Chemistry and Pharmacy	60.5	953704	8
Biology and Chemistry	58.9	451234	38
Dentistry	55.3	690308	18
Management Control Engineering?	54.5	708837	16
Medical Technology	52.0	589586	21
Anthropology	51.7	481048	33
History Education	51.7	344086	54
Public Administration	51.4	555350	23
Laboratory Chemistry	51.2	230367	60
Education in Physical Education	51.0	367168	49
Accounting	49.9	553555	24
Geography	48.6	456739	35
Biochemistry	47.4	544083	26
Veterinary Medicine	47.2	514588	28
Commercial Engineering	43.2	723271	15
Medicine	42.6	957511	7
Law	42.5	736175	13
Sociology	41.7	528381	27
Architecture	41.4	562508	22
Agronomy	36.0	548262	25
Marine Biology	35.2	354881	51
Geology	27.8	1372468	2
Computer Engineering	26.8	1095971	4
Chemical Engineering	25.3	765398	12
Industrial Engineering	20.6	951960	9
Forrest Engineering	20.6	511514	31
Construction Engineering	20.3	724139	14
Civil Construction	18.9	592875	20
Civil Engineering	15.3	966852	6
Civil Engineering for Public Works	14.8	877893	10
Mining Engineering	8.5	1384353	1
Mechanical Engineering	6.1	768762	11
Electronic Engineering	4.2	988355	5
Electrical Engineering	3.6	1167218	3

* The 60 university courses have been ordered from highest to lowest median income; thus, 1 corresponds to the profession with the highest income and 60 to that with the lowest. Elaborated from www.futuro.laboral.cl database.

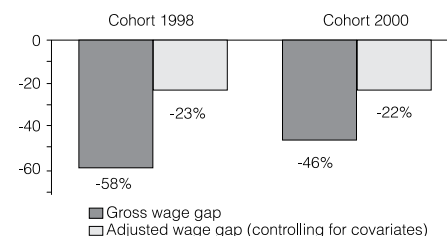


Figure 4: Comparison of the gross wage gaps and with controls for 1998 and 2000 cohorts. Elaborated with data from www.futuro.laboral.cl database.

year after graduation), shows a difference of -58%; that is, on average, women earn 58% less than male professionals. Performing the same calculation with the 2000 university graduate cohort produces a difference of -46%; that is, on average, female professionals earn 46% less than male professionals. However, these percentages are biased, because they compare salaries for professionals in very different areas. The calculation for all professionals is fundamentally determined by the composition of the diverse specialties considered together, and also for the specific characteristics of each person.

In order to determine the gender-based differentials that exist, it is necessary to introduce variables that control the differences between individuals. This is studied in the following section.

Estimation of Salary Differentials

Some methodological problems have to be considered:

Problems of measuring the wage gap

The empirical studies of the male-female wage gap (M/F WG) can be divided into three types:

1- There are many studies that find important differences in the M/F WG but they do not control specific characteristics of individuals nor occupation. These findings relate to the 'gross gap' in salaries according to profession that sometimes dominates debates in public opinion. The implicit, and sometimes explicit message is that the existence of discrimination is the central factor in the M/F WG.

2- Other studies manage to control specific characteristics of individuals and occupation, and then attribute the remaining gap to the fact that there are several unobservable and incalculable variables that cannot be controlled. In other words, gender-based discrimination does not play an important role; from

the point of view of economic rationality, it would not be profitable to be discriminatory (Becker, 1971).

3- A third set of studies combines the previous foci. Using homogenous groups in order to control for the individual characteristics of men and women, they examine the M/F WG. The unexplained residual gap simply corresponds to the existence of discrimination as an explanatory factor for the M/F WG. In this area there are several recent studies that have examined the M/F WG for homogenous groups of professionals (Bertrand and Hallock, 2001; Oostendorp, 2004).

Characteristics of the data

The data used herein is from the *Futuro Laboral* database (www.futurolaboral.cl), which contains information about the prospects in the labor market that graduates of higher education (HE) hold in Chile. It includes gross monthly income, the sector in which they work, number of graduates, new entrants, and estimates of the total number of professionally and technically qualified people. The database comprises basic data about graduates of the different careers from Chilean universities.

The data correspond to university graduates that obtained their professional qualification in 1998 and 2000. The sample includes ~90% of the qualified professionals graduated these years. Data were collected from The Council of Chilean Universities and the Ministry of Education. The gross income declared to the Chilean internal revenue service (SII) was also confidentially used. At all stages, efforts have been made in order to maintain the confidentiality of the raw data. Obviously the identification number (RUT) of the professionals remains confidential. In order to further ensure individuals' anonymity the SII did not provide any data related to an individual with regard to qualification, courses taken, institution of studies and sex.

The data for each person includes age, number of years taken to obtain the degree, and the point score in the academic aptitude test used for admission to Chilean higher education, which includes mathematical and verbal aptitude tests (from www.demre.cl). In addition, the database contains information about the percentage of students entering from private high schools, the fees paid for each career at each university (from www.cse.cl), and the year of entry and graduation from the university for each student. The university careers have been especially selected so that

they have a reasonable number of observations (>40) and represent different areas of knowledge.

Estimation methodology

The standard earnings model has been estimated using Mincer (1974) econometric specification for people that have obtained a professional university degree. The most usual model for estimation is

$$\ln y = \alpha + \lambda g + \beta_0 X + \varepsilon$$

where y : salary received by the individual; α : constant; g : dummy variable, equal to 1 for women and 0 for men; thus for our case, λ captures the effect of gender-based discrimination; X : control variables; and ε : random error.

In this manner it is possible to obtain a first approximation to the calculation of gender-based wage differentials. Among the control variables, those most used are usually experience and age. As a 'proxy' for experience, the difference between age and age of graduation is usually used. However, the data in this article is the observed income in a specific year since the person graduated, and as this experience proxy will be the same for all of the subjects, it is not necessary to control this variable. The control variables are age and age squared, which are very common in the literature.

Nevertheless, there are other possible sources of endogeneity, variables that cannot be directly observed, in the estimation of salary differentials:

-Differences of ability between sexes. One of the possible explanations for the gender-based wage differential observed is that there are differences in ability between them. One possible solution to this problem is to control these abilities. As a proxy for ability level, the points scored on the university entrance exam have been used. These point scores are between 300 and 800. It is important to note that the results from this test can also be affected by socioeconomic status, and this variable will include these effects.

-Differences in the students' socioeconomic background and social network. Students from relatively low socioeconomic background have fewer social contacts to access the best jobs. The Chilean educational system includes a set of private high schools. These are entirely paid for by the student's family and have higher resources than those with public

financing (OECD, 2009). This database contains the percentage of students coming from these schools for each university; to control the effect of socioeconomic background; therefore, this variable will be used as a 'proxy'.

-Different participation and wages according to region. Since Chile is a highly centralized country, women tend to be employed in greater proportions in the metropolitan areas. Since the only city that can be considered metropolitan is the capital, Santiago, a variable will be included to distinguish whether the person works in Santiago or in another region.

-Non-homogeneous distribution of women in the various professions. A dummy will be included which considers the level of feminization of the career.

Thus, the regression equation is:

$$\ln y = \alpha + \lambda g + \phi f + X\beta_0 + \gamma \ln g + \delta_n n + \delta_m m + \varepsilon \quad (1)$$

where f : dummy variable for careers that have $\geq 75\%$ women, g : test score obtained by the individual, n : percentage of students from elite high schools, and m : dummy equal to 1 for work performed in Santiago.

Results Concerning Salary Differentials

In brief, a regression will be estimated in which the dependent variable is the income of professionals, distinguishing between men and women. The control variables are the type of university careers with high female participation; course duration, age, admission entry tests for the university, percentage of students from private high schools, and location in the capital or regions.

Two cohorts of graduates from different universities were used: one from 1998 (4349 observations) and the other from 2000 (6517 observations). The incomes used correspond to those from the second year after graduation as a professional (2000 for the 1998 cohort and 2002 for the 2000 cohort).

The econometric results are shown in Table VI. Most of the estimators have the right signs and are statistically significant at 1%. This is the case for the following variables: female 'dummy', careers with high female participation, personal characteristics (aptitude test); course duration; type of high school and geographical variable (the capital or regions). The estimators for the variables linked to age were not statistically significant.

In summary, the main result is that for gender the values of -0.229 and -0.222 obtained for the 1998 and 2000 cohorts, respectively, are statistically significant at 1%. This implies that there is an average gender-based wage gap ranging from 22 to 23%. In other words, women earn, on average, 22 to 23% less than men.

It can also be seen that by applying the controls described above, the gross M/F WG are considerably reduced, as the gaps when all the professions were considered without controls varied between 58 and 46%. By applying several controls, this percentage is reduced to a half.

Review of Chilean Economic Literature on Female Discrimination

An important part of this research is based in the female labor participation and its changes using Oaxaca (1973) decomposition. Benvi and Perticara (2007) present a recent application and literature review. Most studies are biased to show that there is no gender-based discrimination. This is clearly affected by the conceptual framework used, so the framework will now be outlined.

A basic principle of neoclassic microeconomic theory is that the salary level of an individual is determined by his productivity. As a result, two people that have the same productivity should have the same salary. How then can the wage differences between men and women be explained? In the world of neoclassical theory inhabited by rational and optimizing agents there is no possibility for discrimination to exist. Thus, if a wage gap is found between men and women, the explanation will tend to seek to establish that there must have been a productivity gap according to gender. This productivity differential will be generated by observable and directly unobservable characteristics of the individuals.

The factual data show a persistent wage gap between Chilean men and women (M/F WG) of 33% for the lowest quintiles and 44% for the highest quintile (Durán, 2000) based on data from the national socio-economic characterization survey (CASEN). Ñopo (2006) controlled for similar characteristics between individuals and found an unexplained wage gap of 40 to 80% between men and women for the highest salaries at the top of the distribution; moreover, it was found that male professionals earn 50% more than female professionals. Montenegro and Paredes

(1999) also observed that the M/F WG is greater for the higher quintiles of the distribution.

Despite these findings, Montenegro and Paredes (1999) found it 'reasonable' that the wage gap according to gender increased for the higher salaries of the distribution. The brief explanation provided by the authors is that this type of result would be "consistent with the idea that women experience a reduction of abilities during their career". There is no further foundation or evidence given for this explanation; nonetheless, this does not prevent the authors from later asserting that in the higher levels of the distribution, "women do not experience discrimination according to productivity differentials."

Basch and Paredes (1996) tackled the problem of the persistent M/F WG from an unusual angle. According to these authors, there are dual markets in Chile: a formal modern market and an informal secondary market. There is a wage gap between people who work in both markets, although the gap is larger between those of the formal modern markets. Women mostly work in the informal secondary market; hence, their salaries should be compared with those of male workers from this market. When this is done, the wage gap disappears; in other words, "gender-based discrimination is only an illusory phenomenon." Evidently, these authors avoid the fundamental problem: if women are rational agents, then why do they not choose to work in the formal modern market? This question is valid for all of those who work in the informal secondary sector. There is no response to this question in Basch and Paredes (1996); in fact, the question is not even raised.

In brief, in general the Chilean empirical literature has also found gender-based salary differentials between professionals, the sizes of which are greater than those found in this study.

Final Observations

The discrimination experienced by Chilean women in the professional world in the 20th century was based on the fact that access to the university was mostly restricted to certain professions. The explanatory factors of this phenomenon appear to be cultural issues. From an empirical point of view, it took almost a century to overcome this type of discrimination. It is worth remembering that Chilean women won the right to vote only in 1947 (59 years before the first female president was elected). Nowadays there are virtually no dif-

ferences in the presence of women and men in university careers and professions.

However, the empirical evidence in the present study shows that there is a wage gap of 22-23% between male and female professionals. In this final section we will synthesize a set of explanatory hypotheses from the literature regarding why this wage gap between men and women (M/F WG) may exist. These include the existence of discrimination, human capital and the role of the family.

Discrimination. Discrimination may be due to the arbitrary preferences of employers, employees or clients. Becker (1971) argues that discrimination would be neither rational nor profitable. Nonetheless, low rates of female participation in highly paid jobs, gender segregation in large companies and high executive positions in large corporations may reflect implicit forms of discrimination against women (Bertrand and Hallock, 2001).

Human capital. When accumulated experience leads to high labor productivity, the greater job discontinuity of women and/or relatively lower working day intensity (i.e. fewer weekly hours to avoid extra hours) can generate a M/F WG (Blau and Kahn, 2000). Some studies have emphasized different gender-based psychological characteristics as a factor that affects the M/F WG. Women tend to be more adverse to risk, unsure of their potential and less likely to test their abilities. This influences the types of work and responsibilities that they are likely to undertake. For references, see Niederle and Yestrumskas (2008). Moreover, women are more inclined to take part-time jobs; in the USA, 19% of women working do so part-time but for men that proportion is only 5%. Effective experience explains a large part of the M/F WG (O'Neill, 2003).

Role of the family. Given the traditional division of family tasks, and especially the female role in housework and childcare, women tend to have a working day that is relatively short and discontinuous; as previously mentioned, this impedes the accumulation of experience (Blau and Kahn, 2000; O'Neill, 2003). Moreover, this affects the type of jobs that appear attractive to women and makes them more reticent towards incentives related to longer working days.

The presence of children affects the work continuity of women and normally results in a shorter working day, even for women with an MBA qualification. Women with MBAs and children work on average 24% less than men with

MBAs; however, women with MBAs but no children have a working day that is only 3% less than that of men (Bertrand *et al.*, 2009).

Then, there are women that tend to choose those jobs that are 'family friendly'; this means that they avoid jobs with long working hours and future inflexibility. The characteristics of jobs and responsibilities influence women's decision making; they are concerned that the job and/or responsibility will be compatible with the "dual role of women in the home and work place" (O'Neill, 2003). It could be said that women want to have a high degree of control over their working day in order to face unforeseen circumstances connected to the family.

In order to determine the validity of the three above hypotheses regarding the determinants of the gender wage gap, further research is required at the micro level, using surveys and interviews.

In summary, a wage differential between male and female professionals does exist. In order to determine the causes for this differential and to what extent it is due to gender-based discrimination, the following are necessary: a) studies of homogeneous professional groups, i.e. within each professional cate-

gory, an area currently under investigation; b) more specific studies of the motivations and requirements from the perspective of supply and demand for employment in executive and directive positions for women.

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DISCRIMINACIÓN A LA MUJER A NIVEL PROFESIONAL EN CHILE

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RESUMEN

Este trabajo examina el papel jugado por la mujer en el mercado laboral de los profesionales universitarios chilenos. El papel de las mujeres durante el siglo pasado ha cambiado de paradigma, desde cero o bajos niveles de participación hasta una participación generalizada. El artículo analiza los diferentes estadios de dicha participación y se estima las diferencias actuales entre la remuneración de hombres y mujeres. La brecha

salarial entre dos cohortes de estos profesionales es estimada utilizando una nueva base de datos que permite el control de variables tales como características del personal, habilidades (a través del uso de puntajes de admisión a las universidades) e influencia socioeconómica. Los resultados indican un diferencial de remuneraciones entre géneros de alrededor del 23%.

DISCRIMINAÇÃO À MULHER A NÍVEL PROFISSIONAL NO CHILE

Patricio Meller, Gonzalo Valdés e Bernardo Lara

RESUMO

Este trabalho examina o papel desempenhado pela mulher no mercado laboral dos profissionais universitários chilenos. O papel das mulheres durante o século passado tem mudado de paradigma, desde zero ou baixos níveis de participação até uma participação generalizada. O artigo analisa os diferentes estados de dita participação e se estima as diferenças atuais entre a remuneração de homens e mulheres. A diferença salarial

entre dois coortes de estes profissionais é estimada utilizando uma nova base de dados que permite o controle de variáveis tais como características do pessoal, habilidades (a través do uso de pontuação de admissão nas universidades) e influência socioeconómica. Os resultados indicam um diferencial de remunerações entre géneros por volta de 23%.