National HRD and Investment in Human Capital: Opportunity Costs of U.S. Postsecondary Education

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This study explores opportunity costs of postsecondary education in the U.S. in the past three decades. Based on human capital theory, data from the U.S. Census, along with parameters for high education achievement (involving bachelors and advanced degrees), were fed into a forecasting model developed for this purpose. Beyond descriptive statistics on the opportunity costs for bachelors or advanced degrees, findings on gender differences are discussed in light of the National HRD framework.

Keywords: Human Capital Theory, National HRD, Opportunity Costs of Postsecondary Education

The formal educational process is a key component for the uplift of a nation's workforce. Human Resource Development (HRD) researchers and practitioners, especially the National HRD (NHRD) framework, have focused increasingly on developing and leveraging human talents and skills for societal betterment (McLean, 2004). Moving beyond the limits of an organization and the focus of performance improvement, HRD influences and is influenced by the formal education arena (Harbison & Myers, 1964). Formal education, particularly its focus on the preparation of students for the workforce, is directly linked to the rapid and intense changes affecting organizations and business transactions (Colteryahn & Davis, 2004; Karoly & Panis, 2004). With the development of new theories informing and informed by practice in both educational and organizational settings, the link between the two suggests a demand to better understand specific skills and attitudes associated with new workplace settings and future of work.

The theoretical underpinnings of HRD are diverse. As Weinberg (1998) discussed, the multiple theories supporting the field include economic theory, psychological theory, systems theory, along with theory of performance improvement and learning theory. Stemming from this complex theoretical foundation, this paper integrates elements from two main perspectives: (a) Human Capital Theory (HCT), more specifically an individual's discretionary decision about postsecondary education and (b) NHRD theory, more specifically the societal and economic benefits of a more educationally developed workforce. This integrative analysis involving both HCT and NHRD is due to the fact that the decision to pursue a postsecondary education degree has impacts at the individual and societal levels. Based on HCT, pecuniary and non-pecuniary returns are expected to increase with education. In this paper we examine objective data on the marginal income an individual is giving up (opportunity cost) when deciding not to seek a specific degree (which is the same rationale used to decide in favor of such education). Marginal income acts as a proxy for human development, validated by society. Tsang (1997) defined opportunity costs of education as "the resources utilized in the production of education; they are measured as the economic value of such inputs in their best alternative use" (p. 318). This study focuses on an existing concern related to potential misalignments of expected premiums from each decision at each postsecondary level (i.e., bachelor and advanced degrees). This key issue of postsecondary education opportunity costs in the U.S. is also explored in terms of gender.

Purpose and Goal

Relying on a rational economic decision model approach, patterns of opportunity costs that individuals in the U.S. are "supposed" to consider, when deciding on pursuing a formal postsecondary degree, are identified and analyzed. The economic theory foundation of HRD supports the discussion of individual investments in human capital, while the NHRD perspective supports the analysis from a societal standpoint. With the purpose of shedding light on the issue of investment decisions on human capital, at a national level, this paper aims at exploring patterns and trends related to opportunity costs of academic degrees in the U.S., based on the Human Capital Theory (HCT). These patterns and trends are also analyzed by gender. By collecting evidence on this topic, our goal is to contribute to the field of HRD by discussing elements of making informed decisions at both academic and practical levels.

Theoretical Framework

Under the economic rationality paradigm (Astley & van de Ven, 1983), sound investment decisions require that benefits and sacrifices be compared on a similar basis (Copeland et al., 1994; Siegel & Shim, 2000). This is a crucial element in almost all socioeconomic situations where stakeholders cannot afford simple depletion of scarce resources. Linked to each set of resources and potential benefits there is an embedded value, which is expected to increase under many HRD definitions of systemic improvement (McLagan, 1989; Swanson & Holton, 2001; Weinberg, 1998). In the particular situation of investing in formal postsecondary education, there is an assumption that the overall return for both individual and society outweigh the effort and cost involved.

Economic theory, a theoretical foundation of HRD (Swanson and Holton, 2001; Weinberg, 1998), focuses largely on investment in human capital (Lucas, 1988). Investment in developing humans has been a key concept in the economics literature for decades. For example, Harbison and Myers (1964) stated that "human resource development is the process of increasing the knowledge, the skills, and the capacities of all the people in a society" (p. 2). In addition, they acknowledged Marshall's idea from the 1930's that "the most valuable of all capital is that invested in human beings" (Harbison & Myers, 1964, p. 3). Foundations of Human Capital Theory (HCT) can be traced to Friedman's neoclassic ideas (1976 Economics Nobel laureate), as well as the influential Chicago-School approach to economics (with contributors such as Shultz, Mincer, and Becker). Becker (1992 Economics Nobel laureate and 2001 HRD Scholar Hall of Fame) and his colleagues extended the discussion in economics to human behavior. They argued that investments in education and training are the most relevant types of investments in human capital (Becker, 1962; 1992). According to Becker (1992), human capital is linked to economic growth, from individual to national levels (e.g., per capita GDP). The main proposition of HCT is based on a simple demand theory. When applied to explain participation in education, HCT views the decision to enroll as an investment with future returns minus present costs. The costs involved include direct money outlays, indirect financial burdens, and non-monetary costs. The returns are present at distinct levels including: (a) individual (i.e., income and improved performance), (b) organizational (i.e., productivity/profit), and (c) national (i.e., quality products and services). So under an HCT framework, an individual will invest in "a college education if the present value of the expected social and economic benefits resulting from the education exceeds the present cost of the education" (Stafford, Lundstedt, Lynn, 1984, p. 593). At the national level, investment in higher education comes primarily from support at the state and local government levels. The main thrust of support has been "toward extending higher education to a larger proportion of the population" (p. 594). Numerous HRD and NHRD perspectives consider a trans-organizational focus for the field (McLean, 2004; Ruona & Gibson, 2004; Swanson and Holton, 2001; Weinberg, 1998). A trans-organizational focus of HRD incorporates elements of HCT, in particular the investment in education for the benefit of the socioeconomic health of a nation. By examining the forces at play affecting individual actions toward formal post-secondary education, HRD can better conceive of its trans-organizational role. For example, HRD can better anticipate the supply and demand embedded in a changing workforce and prepare for the needs of new and current employees. As is evident by the postsecondary education figures in the U.S. which show a significant increase in the enrollment rates of young adults (NCES, 2007), HRD would benefit from better understanding this movement and HCT can serve as a framework to explore the drivers for this enrollment pattern.

This discussion on the relevance of formal postsecondary education and its link to the world of work is not new. Many scholars have explored specific phenomena in these terms. However, as Teichler (2007) pointed out, in his exploration of the return on higher education in Europe, studies are still scarce particularly considering their relevance for a knowledge-driven society. Nevertheless, several recent empirical studies provide fertile ground for the approach used here. For example, Crosby and Moncarz (2006) explored a ten-year job outlook for college graduates. In addition, Montgomery and Powell (2006) studied the demand for graduates in the business area by employing opportunity costs (in a slightly distinct approach from the one employed in this study). They addressed income gaps of part- and full-time students when compared to non-students and focused on the tuition component by analyzing the parameters considered by individuals when dealing with stop-go decisions. Bone (2002), analyzing Canadian datasets, explored the decision faced by graduates to continue their studies with a Master's degree, factoring in parameters such as unemployment and field of study, along with opportunity costs. Expanding the focus to policy issues, Webb, Brine and Jackson (2007) discussed inequalities as byproducts of European Union policies. Similarly, Wheeler (2005) discussed two decades of U.S. data on income and education.

Research Hypotheses

Based on the proposed theoretical framework, this quantitative study explores opportunity costs of higher education in the U.S. in the past three decades. The following seven research hypotheses guide the present study.

$H_{0\text{-}1}$: There is no significant correlation between U.S. postsecondary education enrolment rates and opportunity costs of bachelor's or advanced degrees, in the past three decades.

$H_{0\text{-}2}$: The opportunity costs of a bachelor degree in the U.S. (based on adjusted US$ as of 2005) have been similar for males and females, in the past three decades.

$H_{0\text{-}3}$: The opportunity costs of an advanced degree in the U.S. (based on adjusted US$ as of 2005) have been similar for males and females, in the past three decades.

$H_{0\text{-}4}$: The opportunity cost gaps, by gender, involving a bachelor degree in the U.S. (based on adjusted US$ as of 2005) did not change in the past three decades.

$H_{0\text{-}5}$: The opportunity cost gaps, by gender, involving an advanced degree, in the U.S. (based on adjusted US$ as of 2005) did not change in the past three decades.

$H_{0\text{-}6}$: The yearly percentage differences of opportunity costs of a bachelor degree in the U.S. between males and females did not change, significantly, in the past three decades.

$H_{0\text{-}7}$: The yearly percentage differences of opportunity costs of an advanced degree in the U.S. between males and females did not change, significantly, in the past three decades.

Limitations of the study are related to the data source and implied definitions and assumptions for the parameters of the forecasting model used to estimate the opportunity costs. All calculations supporting the forecasts are based on best practices of accounting and personal finance.

Research Design and Methods

To test these hypotheses, this ex post facto study was developed employing elements of both descriptive and causal-comparative research (Gall, Gall, & Borg, 2003). We have relied on objective measures from existing sources, and a set of techniques to collect, record, compile and analyze data to support the quantitative interpretation of facts. The literature review supported the analysis while suggesting elements for discussion.

The main dataset used in this study was obtained from the U.S. Census Bureau (Education and Social Stratification Branch) and is part of the publicly available Current Population Survey (CPS): noninstitutionalized population, excluding members of the Armed Forces living in barracks (USDOC-CB, 2007). The mean annual earnings in current U.S. dollars was the main variable for this study, and it was retrieved from Table A-3 of the CPS report. We also relied on enrollment rates of 18- to 24-year-olds in degree-granting institutions, according to the 2006 Digest of Education Statistics (NCES, 2007), specifically from its Table 189 (Enrollment rates of 18- to 24-year-olds in degree-granting institutions, by sex and race/ethnicity: 1967 through 2005).

After organizing the dataset, with figures from Table A-3 of the CPS report (Mean Earnings of Workers 18 Years and Over, by Educational Attainment, Race, Hispanic Origin, and Sex: 1975 to 2005), we classified the data into three distinct levels: individuals (a) without a bachelor's degree (including non-high school graduates, high school graduates, or some college or associate degrees), (b) with a bachelor's degree, or (c) with an advanced degree. For each year in the dataset we calculated the differences related to holding an advanced degree (compared to having a bachelor's degree) and to holding a bachelor's degree (compared to not having it). We also adjusted all the data to US$ of 2005 (based on U.S. CPI-U data: Consumer Price Index, All Urban Consumers, from the U.S. Department of Labor, Bureau of Labor Statistics). Besides yearly data, we also computed a variable for the lifetime equivalent of the original annual figures, showing the equivalent amount for the assumed 34 (bachelor's degree) and 31 (advanced degrees) years of work. These parameters are based on a hypothetical retirement age (55 years) and (a) age at the beginning of the program (17 years for bachelor's degrees and 21 years for advanced degrees) plus (b) time to finish the program (four years for bachelor's degrees and three years for advanced degrees). The 30-year series was explored as a whole, as well as segmented according to gender, and considering three conditions: non-bachelor (*NB*), bachelor's (*BD*) and advanced degrees (*AD*). All the calculations were developed with present values, which means that time value of money adjustments (TVM) were considered (Siegel & Shim, 2000). Thus, for the purposes of this study, the opportunity cost (1) of the decision to pursue a degree is the present value (*PV*) of the extra annual income flow (*EAI*) discounted by an annual interest rate (*i*), for the period (*k*), defined by

$$PV = \sum_{j=1}^{k} \frac{EAI_j}{(1+i)^j}, \qquad (1)$$

which is just the equivalent of the lifetime income estimates in the US$ base value of the year being analyzed. We used k=34 for bachelor's and k=31 for advanced degrees. The extra annual income (*EAI*) parameter was computed by comparing the income variation of having or not the specific degree under analysis: (a) advanced degrees (advanced degree income minus bachelor's degree income) and (b) (bachelor's degree income minus non-bachelor

income). *EAI* was based on the U.S. Census Bureau data (CPS report), and after being adjusted to US$ of 2005, it was assumed to be constant (no real increase or decrease) during the simulation of the income flow. We used a constant real compound interest rate (*i*) of 1.74% per year to perform TVM calculations, which is the result of discounting a hypothetical 5% nominal annual interest rate by 3.2% annual inflation rate (U.S. CPI-U, as of 2005).

Findings

Male participation decreased from 58.5% to 53.3% in this period. In the last year available (2005) the dataset shows income of $81,258 males and $70,956 females. The dataset proportions according to educational attainment, for 2005, are 10.0% with advanced degrees, 19.5% with bachelor's degrees, 29.8% with some college or associate degrees, 30.0% high school graduates, 10.7% non-high school graduates. Table 1 presents the evolution, in the past three decades, of the opportunity costs related to academic degrees in the U.S. (all figures are adjusted to US$ of 2005: same purchasing power). Based on the parameters used here, the opportunity cost of a bachelor's degree in the U.S. by 2005 was equivalent to US$ 690,323.78. This corresponds to the present value that an individual deciding to pursue the degree would add to his or her lifetime income. In this study, this is the opportunity cost of such decision.

Table 1. *Opportunity Costs of Postsecondary Degrees and Enrollment Rates in the U.S., including Males and Females (adjusted US$, as of 2005)*

YEAR	Opportunity Costs (Year)		Opportunity Costs (Lifetime*)		
	Bachelor Degrees	Advanced Degrees	Bachelor Degrees	Advanced Degrees	Postsecondary Enrollment Rates (%)
1975	17,626.61	15,947.08	449,514.92	379,605.29	26.3
1976	17,359.62	16,742.94	442,706.05	398,550.04	26.7
1977	18,192.55	15,694.90	463,947.50	373,602.41	26.1
1978	17,895.51	14,623.54	456,372.40	348,099.59	25.3
1979	17,145.69	14,418.84	437,250.43	343,227.04	25.0
1980	17,110.08	12,402.97	436,342.33	295,241.13	25.7
1981	16,025.06	13,481.93	408,671.95	320,924.72	26.1
1982	17,112.19	13,444.33	436,396.18	320,029.69	26.6
1983	17,944.33	13,335.70	457,617.43	317,443.74	26.2
1984	18,798.80	13,383.41	479,408.13	318,579.46	27.1
1985	20,025.51	14,578.53	510,691.78	347,028.19	27.8
1986	21,464.59	14,747.29	547,391.19	351,045.38	27.9
1987	20,022.83	15,556.95	510,623.54	370,318.65	29.6
1988	20,540.89	15,485.33	523,835.11	368,613.66	30.3
1989	22,111.43	16,195.73	563,886.90	385,524.05	30.9
1990	21,039.20	15,459.63	536,543.06	368,002.03	32.0
1991	20,334.91	21,101.58	518,582.04	502,303.27	33.3
1992	21,100.20	22,304.29	538,098.46	530,932.72	34.4
1993	23,238.67	27,933.98	592,634.04	664,942.26	34.0
1994	24,379.99	24,881.64	621,740.08	592,284.16	34.6
1995	22,056.26	25,228.81	562,479.97	600,548.25	34.3
1996	21,571.38	28,884.24	550,114.56	687,562.15	35.5
1997	22,787.03	27,683.93	581,116.17	658,989.94	36.8
1998	25,613.85	23,592.96	653,206.07	561,608.27	36.5
1999	26,547.20	25,812.19	677,008.35	614,434.97	35.6
2000	28,510.93	24,496.43	727,087.38	583,114.48	35.5
2001	27,752.60	24,532.15	707,748.41	583,964.84	36.3
2002	27,657.55	23,481.60	705,324.48	558,957.37	36.7
2003	26,701.97	24,832.82	680,955.20	591,122.00	37.8
2004	25,806.11	27,559.11	658,108.95	656,018.90	38.0
2005	27,069.33	25,257.00	690,323.78	601,219.21	38.9

* Present value: 34 years (bachelor) and 31 years (advanced degrees)

A very interesting finding related to this, and directly tied to the Human Capital Theory, shows up when examining data of U.S. postsecondary enrollment rates (18- to 24-year-olds in degree-granting institutions) for this

period, using correlational analysis. Both correlation coefficients between enrollment rates and lifetime opportunity costs of degrees (as present in Table 1) were all significant at the .05 alpha level and can be considered very strong: r = .90 for bachelor's degrees and r = .91 for advanced degrees.

In addition, a 54% of real increase (US$ of equivalent purchasing power) of the lifetime opportunity cost of a bachelor's degree, and a 58% of real increase for an advanced degree, in this period were evident. Also, as shown in Table 1, 2000 had the highest opportunity cost for the bachelor's degree (US$ 727,087.38) and in 1996 the highest for the advanced degree (US$ 687,562.15), for both males and females. When splitting the data into two separate sets by gender, not only the evolution of the opportunity costs for males and females are unveiled, but also the corresponding gap (Table 2).

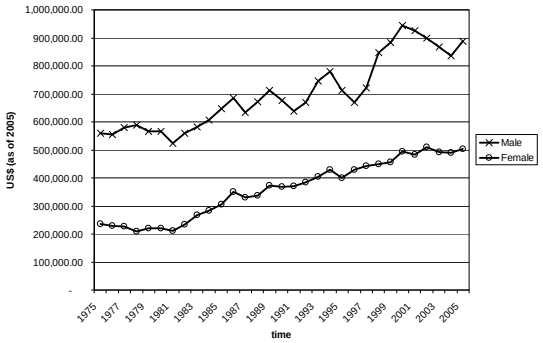
Table 2. *Opportunity Costs of Postsecondary Degrees in the U.S. (adjusted US$, as of 2005)*

YEAR	Gap – Bachelor Degree			Gap – Advanced Degree		
	Male	Female	Difference	Male	Female	Difference
1975	560,111.57	235,449.91	324,661.66	338,214.23	246,704.55	91,509.68
1976	555,972.04	230,062.43	325,909.61	366,685.65	242,005.99	124,679.66
1977	579,064.56	226,206.94	352,857.62	352,812.62	224,391.59	128,421.03
1978	588,677.87	208,643.39	380,034.48	314,658.64	227,812.00	86,846.64
1979	566,772.23	220,694.73	346,077.50	315,628.00	207,665.17	107,962.83
1980	566,255.77	220,457.95	345,797.82	254,224.44	191,486.41	62,738.03
1981	522,729.71	211,952.00	310,777.71	292,489.00	218,024.24	74,464.76
1982	559,008.95	232,907.49	326,101.46	305,962.45	216,693.29	89,269.16
1983	581,481.16	266,762.92	314,718.24	298,539.94	223,344.85	75,195.10
1984	606,470.54	284,036.89	322,433.65	295,357.17	242,066.70	53,290.47
1985	646,515.21	306,254.60	340,260.60	360,119.52	219,830.61	140,288.91
1986	684,492.71	350,289.77	334,202.95	358,850.16	214,164.83	144,685.33
1987	633,412.86	331,452.26	301,960.61	387,261.07	236,825.51	150,435.56
1988	671,637.81	337,804.67	333,833.14	383,979.11	227,691.64	156,287.48
1989	713,423.97	372,778.28	340,645.69	429,351.50	220,749.36	208,602.14
1990	675,937.56	368,403.37	307,534.19	386,533.74	246,461.06	140,072.69
1991	638,573.62	370,823.22	267,750.40	544,935.56	345,666.29	199,269.26
1992	669,102.73	384,705.96	284,396.76	605,885.59	325,491.61	280,393.98
1993	746,382.03	404,797.70	341,584.32	795,369.78	385,427.15	409,942.63
1994	778,863.85	429,911.52	348,952.34	651,038.90	421,039.03	229,999.87
1995	712,452.12	400,895.25	311,556.87	716,161.49	334,698.81	381,462.68
1996	668,856.34	429,468.16	239,388.18	820,867.13	412,566.92	408,300.21
1997	720,395.79	443,439.84	276,955.95	810,333.72	365,687.13	444,646.59
1998	846,337.43	448,646.94	397,690.49	632,026.78	385,091.41	246,935.37
1999	882,139.74	455,972.66	426,167.08	735,150.97	383,997.44	351,153.53
2000	944,839.53	494,623.04	450,216.49	687,567.00	379,041.96	308,525.04
2001	925,822.17	482,381.46	443,440.72	702,878.84	373,988.45	328,890.39
2002	898,548.14	509,609.17	388,938.97	704,394.82	331,989.15	372,405.67
2003	866,977.03	492,822.05	374,154.98	726,320.06	382,324.25	343,995.81
2004	836,361.93	490,121.51	346,240.41	839,269.08	390,003.43	449,265.64
2005	888,109.26	503,257.66	384,851.60	771,227.83	353,942.61	417,285.22

If compared to males, females presented lower opportunity costs for both bachelor's and advanced degrees, in this period. Descriptives of opportunity costs for bachelor's degrees show a higher coefficient of variation for females (M= 359,563.60, SD= 102,934.70) when compared to males (M= 701,152.50, SD= 127,485.50): respectively .29 and .18. But, comparing opportunity costs for advanced degrees, females present a lower coefficient of variation when compared to males: respectively .26 and .39. These indicators show a similar variability in both female series (bachelor's and advanced degrees), and a very distinct variability for the males series (.18 and .39).

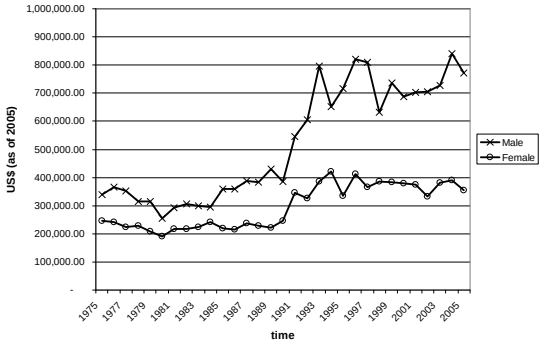
Based on these figures, significant differences of opportunity costs of bachelor's degrees in the U.S. for males and females, in the past three decades, were found after exploring t test results ($t(60) = -11.608$, $p = .000$). Although the opportunity costs of the bachelor's degree, for both males and females, have been increasing in the period, the

gender gap has been somewhat steady. Graph 1 shows the departure from US$560,111.57 to US$888,109.26 for males (58% increase), in this period, and from US$235,449.91 to US$503,257.66 for females (113% increase).



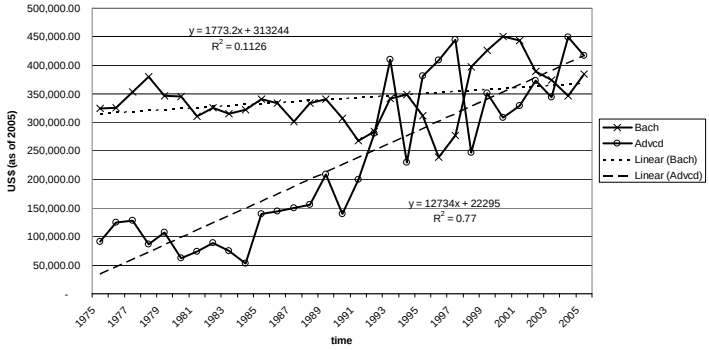
Graph 1. Opportunity costs of bachelor's degrees in the U.S. by gender (adjusted US$, as of 2005)

Such gap stability clearly is not the case in terms of advanced degrees (Graph 2), with the last 15 years presenting a tremendous gap increase. Graph 2 shows the departure from US$ 338,214.23 to US$ 771,227.83 for males (a 128% increase), in the analyzed period, and from US$ 246,704.55 to US$ 353,942.61 for females (a 43% increase). Also, significant differences (at the .05 alpha level) of opportunity costs of advanced degrees in the U.S. for males and females, in the past three decades, were found based on *t* test results ($t(60) = -5.814$, $p = .000$).



Graph 2. Opportunity costs of advanced degrees in the U.S. by gender (adjusted US$, as of 2005)

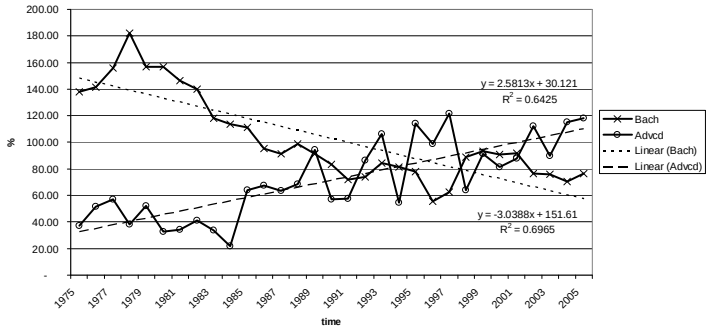
Exploring this phenomenon in more depth, linear regressions for both cases (Graph 3) were used. The first model, which analyzed the gender gap in terms of bachelor's degrees, although presenting a positive coefficient (US$ 1,773.20 per year) for the gap estimator, did not result in a good fit ($R^2 = .11$, $p = .065$). This suggests that no relevant trends on increasing or decreasing gaps can be claimed. The second model, which analyzed the gender gap in terms of advanced degrees, presented a steep coefficient (US$ 12,734.00 per year) for the gap estimator, with a good fit ($R^2 = .77$, $p = .000$). This suggests that a trend (increasing gender gap for advanced degrees) can be claimed.



Graph 3. Opportunity cost gaps by gender in the U.S. and corresponding trend lines (adjusted US$, as of 2005)

Additional analyses were developed to explore this in percentage terms, due to the overall increase movement in opportunity costs (absolute value). The percentages of gender gap for the bachelor's degree were declining, as suggested by the regression model ($R^2 = .69$, $p = .000$), based on a percentage gap estimator coefficient of -3.03 per

year (Graph 4). In the opposite direction, the regression model (R^2 = .64, p = .000) of gender gap for advanced degrees, presented an increasing trend, with a percentage gap estimator coefficient of +2.58 per year. Thus, in this period, the gender percentage gap is decreasing for bachelor's degrees and increasing for advanced degrees.



Graph 4. Opportunity costs of postsecondary education in the U.S.: Gender differences (%) and trend lines

In summary, postsecondary education opportunity costs in the U.S. have been increasing for both males and females in the past three decades. This increase is strongly correlated with raising enrollment rates, as hypothesized by the Human Capital Theory. A more accentuated gender gap is remarkable in terms of advanced degrees.

Conclusion and Recommendation

Six out of the seven null hypotheses in this study were rejected (α = .05). In the analyzed period, significant and strong positive correlations between enrolment rates and opportunity costs for both bachelor's and advanced degrees were found (H_1). The opportunity costs of a degree in the U.S. have been much higher for males (H_2 and H_3). No significant changes were identified (H_4) for opportunity cost gaps by gender, at the bachelor's level (Graph 3). Its regression model presented a low R^2 (.11) and the gap estimator was not significant (p = .065). However, the gender gap for advanced degrees has significantly changed (H_5). Similar analyses aiming at the gender gap in percentage terms (Graph 4) yield evidence to reject both sixth ($H_{0\text{-}6}$) and seventh ($H_{0\text{-}7}$) null hypotheses (bachelor's and advanced degrees). Thus, this study demonstrated how opportunity costs, within a rational economic framework, may inform decisions related to postsecondary education in the U.S. Findings are aligned with the HCT idea linking education to economic return. We recommend NHRD actions, such as disclosure of this concept, targeting decision models of individuals and nationwide educational policies, with potential implications for workforce development.

A note of caution in interpreting these results is that a rational economic framework is one of many models explaining participation in higher education. As Stafford, Lundstedt, and Lynn (1984) stressed, there are at least two other frameworks that explain participation in high education: (a) demographic theory and data (i.e., birth rate) and (b) individual choice (e.g., sociological and psychological factors). Economic theory, however, combines the availability of life choices at the individual level with the potential costs and benefits of the investment of resources at the society level. Economic factors are crucial to understanding participation because they effect the "key decisions made by individuals to enroll and on the decisions made by society to support higher education which affect participation by affecting access" (Stafford, Lundstedt, and Lynn, 1984, p. 594). Rational economic models, however, may be inadequate in fully explaining gender inequalities in higher education. These models tend to suggest that men and women make choices in the hopes of realizing the same future benefits, failing to reflect that "women's (and men's) preferences appear to be more multidimensional" (Bradley, 2000, p. 11). Women and men may factor similar elements, such as opportunity costs, but assign different priorities and values to these elements.

In regards to gender differences in higher education, much of the literature has focused on three aspects: (a) access, (b) educational experiences, and (c) the outcomes. As Jacobs (1996) pointed out, women "fare relatively well in the area of access, less so in terms of the college experience, and are particularly disadvantaged with respect to the outcomes of schooling" (p. 154). For example, as evidenced here, women's earnings significantly lag behind men's despite roughly equal enrollment. Additional explanations for this inequality is beyond the bounds of this study but it is important to stress a few different theoretical explanations, ranging from biological to structural conditions, to symbolic processes (Goetz & Grant, 1988). In addition, particular aspects of higher education have been examined such as fields of study, which reflect sex typing and faculty representation, which males dominate.

Contributions

This study carries implications for theory and practice of HRD. Based on this evidence, new studies exploring aspects of postsecondary education opportunity costs can be developed in light of NHRD, expanding the field with a bolder intersection with investment decision. Also, as a field of practice, HRD can benefit from this perspective by supporting individuals deciding on their education with models employing concepts of investment in human capital.

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