College enrollment and real-life factors

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ABSTRACT

This study examines how real-life factors influence unexpected shocks/changes in college enrollment. The results are provided for both male and female groups. While family income significantly affects unexpected shocks on female enrollment, college tuition and consumer sentiment turn out to have no significant impact on both male and female groups. Although there is still room to delve into more various causes, given limited data availability, this study contributes to the literature in the sense that the significant relationship between unexpected shocks on female enrollment and family income is identified and it can be partially explained by socioeconomic status of family or gender differences in psychological characteristics.

Keywords: College enrollment, unexpected shocks, broad economic factors, real-life factors
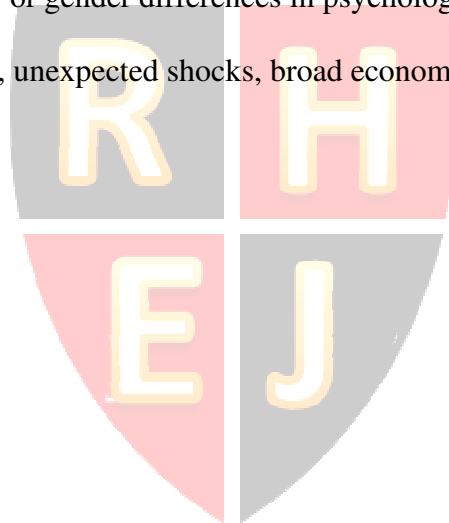
INTRODUCTION

College enrollment is one of the topics that have been traditionally studied. While college enrollment is expected to be affected by non-economic factors as well as broad economic factors, no studies have separated and examined the effect of the factors on college enrollment. This study pays attention to unexpected shocks resulting from filtering out broad economic effects and investigates how real-life factors influence the unexpected shocks.

This study investigates and compares male and female student groups. First of all, unexpected shocks are obtained from removing broad economic effects on college enrollment. They purely represent unexpected increases or decreases in college enrollment. Then, the main purpose of this study is to examine how real-life factors affect unexpected shocks on college enrollment and identify if there is any difference between two gender groups. In conclusion, it is found that only family income significantly influences unexpected shocks on female enrollment. Some rationales are presented in the discussion section. This study contributes to the literature in that it identifies the relationship between real-life factors and unexpected shocks on college enrollment.

LITERATURE REVIEW

Studies on college enrollment can be classified into a few categories. The first category is the analysis of cost aspects. McPherson and Schapiro (1991) find that an increase in the net cost of college attendance has a negative impact on college enrollment for white students from low-income families. Braunstein et al. (1999) examine the effect of financial factors on college enrollment and show that the receipt of financial aid has a positive impact on college enrollment decision. Linsenmeier et al. (2006) discover that low-income students are more likely to enroll after their university's financial aid packages change from loans to grants. Solis (2017) argues that credit access leads a significant increase in college enrollment. Ionescu (2009) investigates the effect of student loan policies on college enrollment and default rates and finds that while parent's wealth has little impact on college enrollment, loan repayment flexibility significantly increases college enrollment. The second category focuses on educational aspects and shows how shadow education (educational activities outside formal schooling) or learning ability affects college enrollment (Leppel, 1993 and Buchmann et al., 2010). The third category considers income aspects. Lovenheim (2011) finds that the housing wealth of families is positively associated with their children's college enrollment and that the positive effect becomes more significant to lower-resource families. Perna et al. (2016) show that students from African American and Hispanic descent as well as ones from low-income families are less likely to enroll in college than students who have other backgrounds. Last, some studies explore functional aspects. Rowan-Kenyon (2007) investigates predictors of college enrollment and finds that college preparation affects college enrollment. Cho (2007) focuses on the gender gap in college enrollment between male and female students and finds that women's optimizing responses to labor market opportunities play a role in increasing female enrollment. Hill (2008) identifies college-linking strategies and finds that the strategies high schools employ to help their students influence the volatility of college enrollment. Hinrichs (2012) examines how affirmative action bans affect college enrollment or educational attainment and finds that they reduce underrepresented minority enrollment. Gurantz et al. (2020) identify that brochures, emails, text messages, and application fee waivers do not lead college enrollment to increase.

Unlike previous studies, this study focuses on unexpected shocks on college enrollment by filtering out broad economic effects and examines how unexpected shocks are affected by real-life factors. The following sections provide data, methods, results, discussion, and conclusion.

DATA AND METHODS

First of all, college enrollment (CE) data are obtained from the U.S. Census Bureau. They consist of male, female, and both sexes who are 18 to 24 year-old high school graduates enrolled in colleges. In order to obtain unexpected shocks on college enrollment, broad economic effects are separated based on three major economic factors: Gross Domestic Product (GDP), Consumer Price Index (CPI), and Unemployment Rate (UE). Then, real-life factors are investigated to explain unexpected shocks on college enrollment. Three real-life factors are employed given limited data availability and accessibility. They are college tuition (TUI), family income (FMI), and consumer sentiment index (SENT). While GDP, UE, CPI, and SENT are downloadable from the Federal Reserve Bank of St. Louis, FMI and TUI are obtained from the U.S. Census Bureau and the U.S. Bureau of Labor Statistics, respectively. Since some of these data are available only on an annual basis and their time periods are limited, for this study, all data are annual, and the range of each data set is from 1979 to 2018. Also, for factors that have more frequent data points, their annual averages are used. Figure 1 shows historical values for each factor. While GDP and CPI show an increasing trend consistently over time, the rest of factors show volatile movements. In particular, female enrollment tends to be higher than male enrollment from 1994 to 2018.

The following regression model is employed to filter out broad economic effects on college enrollment.

$$Y_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i X_{it} + \varepsilon_t \qquad (1)$$

where Y_t is a change in college enrollment (male, female, and all) at time t and X_{it} is a change in economic factor i at time t. Thus, three regressions are implemented depending on Y_t.

$$UES_t = Y_t - \widehat{Y_t} \qquad (2)$$

where $\widehat{Y_t}$ is the estimated value of Y_t from Equation (1). In Equation (2), UES_t is defined as an unexpected shock on college enrollment that are not explained by broad economic factors. If UES_t is positive (negative), then, there exists an unexpected increase (decrease) in college enrollment. In fact, since it is important to recognize whether the unexpected shock is positive or negative, the following logit regression model is used to investigate how real-life factors affect unexpected positive or negative shocks.

$$Pr(Z_t|X) = F(\beta_0 + \beta_1 TUI_t + \beta_2 FMI_t + \beta_3 SENT_t) \qquad (3)$$

where $F(\cdot)$ is the distribution function of the logistic distribution. UES_t determines the dichotomous value of Z_t. If UES_t is positive, Z_t is equal to one and zero otherwise.

RESULTS

Table 1 shows three regression results from Equation (1). Since the results are based on time series data, using 1%, 5%, and 10% significance levels is common. It appears that the unemployment rate statistically significant for female enrollment. In other words, if the unemployment rate increases (decreases), female enrollment also tends to increase (decrease). While GDP and UE have a positive sign across all three regressions, CPI has a negative sign for female and combined groups. This means that an increase in CPI tends to have a negative impact on female enrollment whereas an increase in GDP and UE tends to have a positive impact on male, female and combined groups. However, their coefficients are not statistically significant.

On the other hand, Table 2 provides logit regression results for the main purpose of this study. The results show the effect of real-life factors on unexpected shocks obtained from Equation (2). TUI and SENT are not statistically significant for male, female, and combined groups. However, FMI is statistically significant for female enrollment and its sign is positive. This means that as family income increases (decreases), female enrollment tends to increase (decrease) regardless of broad economic effects. It is interesting that family income has a significant impact only on female enrollment. College tuition and sentiment are not statistically significant at all for all groups.

DISCUSSION

It is well supported that female enrollment and completion rate are higher than male enrollment and completion rate (Jacobs, 1999; Diprete & Buchmann, 2006; Goldin et al., 2006; Conger & Long, 2010; Ewert, 2012; Conger, 2015; and Doherty, Willoughby, & Wilde, 2016). Unlike previous studies, this study pays attention to the relationship between real-life factors and unexpected shocks on college enrollment and examines if there is any difference between male and female groups.

Based on the results, it is concluded that family income significantly influences female enrollment rather than male enrollment. This finding is not consistent with traditional human capital theory (Becker, 1964) claiming that women who are expected to have fewer job opportunities tend to be reluctant to invest in human capital such as education and training. However, Beattie (2002) explains that women's college enrollment is more affected by socioeconomic status of their family than men's enrollment and also, women's enrollment decision would be more complicated than men's enrollment decision. Although socioeconomic status of family is not determined only by family income, it is likely to be closely related to family income. In this regard, it is persuasive that female students' college enrollment is significantly influenced by family income.

As Beattie (2002) mentions, since women's enrollment decision may be intricately associated with various factors, the significant relationship between family income and female students' college enrollment may also be explained by gender differences in psychological characteristics that influence men's and women's decision making. According to Gilligan (1977), females' making decision is influenced by relationships with others and by consideration of how their decisions will affect others. She finds that females place a greater emphasis on caring in moral decision making. Thus, it is reasonable that females contemplate how their educational costs will affect their family members and seriously take into account family income when they make a decision about college enrollment.

CONCLUSION

This study investigates how real-life factors affect unexpected shocks on college enrollment that are not explained by broad economic effects. The results are provided for male and female groups. Unexpected shocks on college enrollment are extracted from filtering out broad economic effects and then, three real-life factors are examined to identify how they influence unexpected shocks.

While family income significantly influences female enrollment, college tuition and consumer sentiment are not significant at all for both male and female enrollments. Although this can be partially explained by socioeconomic status of family or gender differences in psychological characteristics, further research would be needed in order to delve into more various causes.

REFERENCES

Beattie, I. (2002). Are all "adolescent econometricians" created equal? Racial, class, and gender differences in college enrollment. *Sociology of Education*, 75, 19-43.

Becker, G. (1964). Human capital: A theoretical and empirical analysis with special reference to education. Chicago, IL: University of Chicago Press.

Braunstein, A., Mcgrath, M., & Pescatrice, D. (1999). Measuring the impact of income and financial aid offers on college enrollment decisions. *Research in Higher Education*, 40, 247-259.

Buchmann, C., Condron, D., & Roscigno, V. (2010). Shadow education, American style: Test preparation, the SAT and college enrollment. *Social Forces*, 89(2), 435-461.

Cho, D. (2007). The role of high school performance in explaining women's rising college enrollment. *Economics of Education Review*, 26(4), 450-462.

Conger, D. (2015). High school grades, admissions policies, and the gender gap in college enrollment. *Economics of Education Review*, 46, 144-147.

Conger, D. & Long, M. (2010). Why Are Men Falling Behind? Gender Gaps in College Performance and Persistence. *The Annals of the American Academy of Political and Social Science*, 627(1), 184-214.

Diprete, T. & Buchmann, C. (2006). Gender-specific trends in the value of education and the emerging gender gap in college completion. *Demography*, 43, 1-24.

Doherty, W., Willoughby, B., & Wilde, J. (2016). Is the Gender Gap in College Enrollment Influenced by Nonmarital Birth Rates and Father Absence? *Family Relations*, 65(2), 263-274.

Ewert, S. (2012). Fewer Diplomas for Men: The Influence of College Experiences on the Gender Gap in College Graduation. *The Journal of Higher Education*, 83(6), 824-850.

Gilligan, C. (1977). In a different voice: Women's conceptions of self and of morality. *Harvard educational review,* 47(4), 481-517.

Goldin, C., Katz, L., & Kuziemko, I. (2006). The Homecoming of American College Women: The Reversal of the College Gender Gap. *Journal of Economic Perspectives*, 20(4), 133-156.

Gurantz, O., Howell, J., Hurwitz, M., Larson, C., Pender, M., & White, B. (2020). A national-level informational experiment to promote enrollment in selective colleges. *Journal of Policy Analysis and Management*, doi.org/10.1002/pam.22262.

Hill, L. (2008). School strategies and the "College-Linking" process: Reconsidering the effects of high schools on college enrollment. *Sociology of Education*, 81(1), 53-76.

Hinrichs, P. (2012). The effects of affirmative action bans on college enrollment, educational attainment, and the demographic composition of universities. *Review of Economics and Statistics*, 94(3), 712-722.

Ionescu, F. (2009). The federal student loan program: Quantitative implications for college enrollment and default rates. *Review of Economic Dynamics*, 12(1), 205-231.

Jacobs, J. (1999). Gender and the Stratification of Colleges. *The Journal of Higher Education*, 70(2), 161-187.

Leppel, K. (1993). Logit estimation of a gravity model of the college enrollment decision. *Research in Higher Education*, 34, 387-398.

Linsenmeier, D., Rosen, H., & Rouse, C. (2006). Financial aid packages and college enrollment decisions: An econometric case study. *Review of Economics and Statistics*, 88(1), 126-145.

Lovenheim, M. (2011). The effect of liquid housing wealth on college enrollment. *Journal of Labor Economics*, 29(4), 741-771.

McPherson, M. & Schapiro, M. (1991). Does student aid affect college enrollment? New evidence of a persistent controversy. *The American Economic Review*, 81(1), 309-318.

Perna, L., Rowan-Kenyon, H., Bell, A., Thomas, S., & Li, C. (2008). A typology of federal and state programs designed to promote college enrollment. *Journal of Higher Education*, 79(3), 243-267.

Rowan-Kenyon, H. (2007). Predictors of delayed college enrollment and the impact of socioeconomic status. *Journal of Higher Education*, 78(2), 188-214.

Solis, A. (2017). Credit access and college enrollment. *Journal of Political Economy*, 125(2), 562-622.

APPENDIX

Table 1. Regression results – college enrollment

	Male	Female	Combined
Intercept (α_0)	0.0001	0.0011	0.0000
GDP (α_1)	0.1180	0.2917	0.2243
CPI (α_2)	0.0356	-0.1075	-0.0531
UE (α_3)	0.0614	0.0775[*]	0.0711[**]

[***], [**], and [*] are the 1%, 5%, and 10% significance levels, respectively.

Table 2. Logit regression results – unexpected shocks

	Male	Female	Combined
Intercept (β_0)	0.1091	-0.0945	-0.0163
TUI (β_1)	0.0498	1.7792	2.1523
FMI (β_2)	13.9500	34.5500[*]	24.8570
SENT (β_3)	1.0296	-4.7516	-2.5325

[***], [**], and [*] are the 1%, 5%, and 10% significance levels, respectively.

College Enrollments

Male   Female

Gross Domestic Product

Unemployment Rate
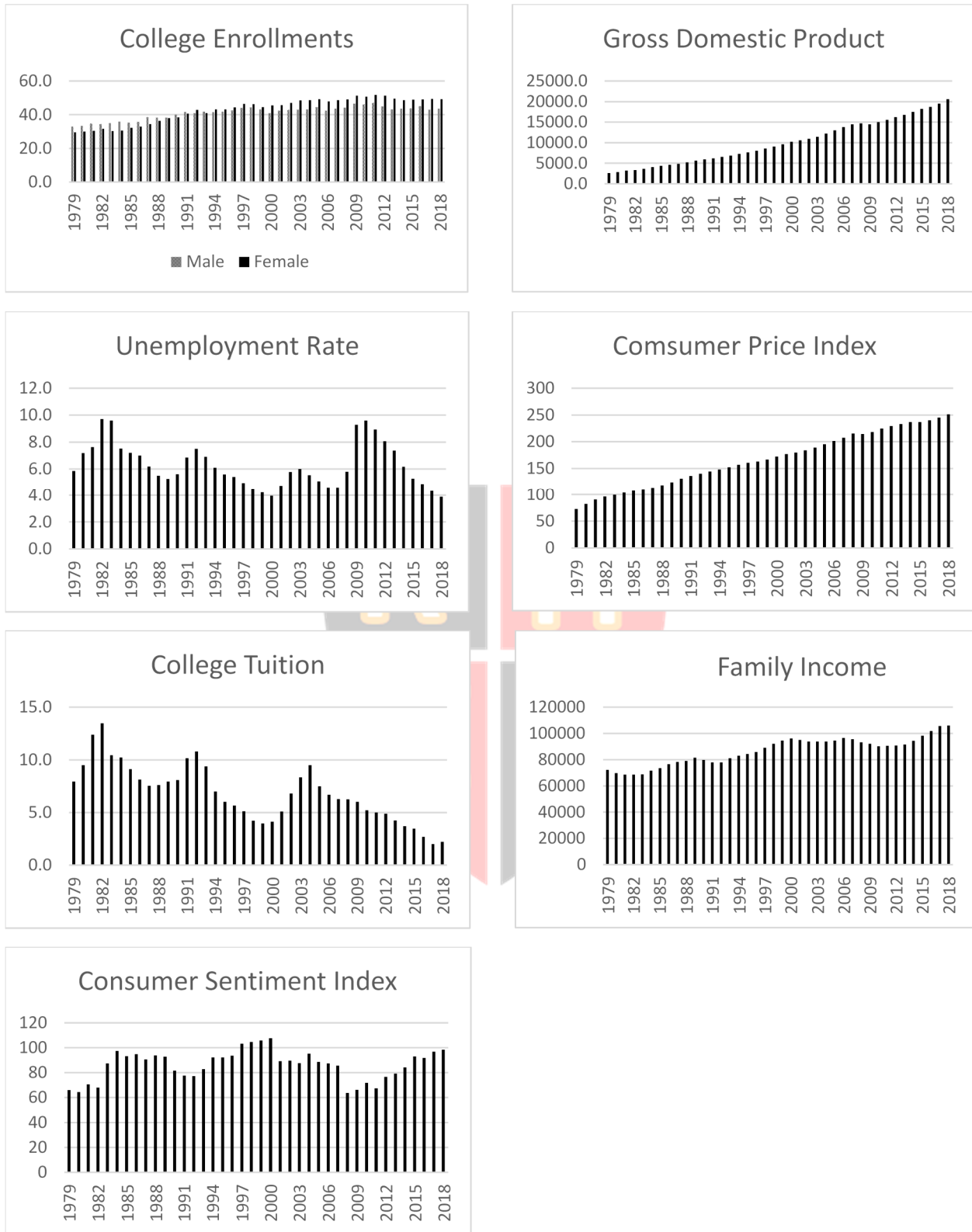
Comsumer Price Index

College Tuition

Family Income

Consumer Sentiment Index

Figure 1. Historical values