

Factors Affecting College Enrolment of Cor Jesu College for Academic Years 1992-2008

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ABSTRACT

The study mainly sought to determine factors affecting college enrolment of Cor Jesu College for academic year 1992-1993 to academic year 2008-2009. Specifically, it wanted to establish growth and levels of enrolment of the school as well as its income and tuition elasticities. The study proposed two models to explain the variation of college enrolment. The first model showed per capita income, college-bound population, tuition, academic programs and major course offerings as predictors of first-semester enrolment. Data from the Nursing Department and Weekend College were excluded because of tuition differential. The second model used the same set of predictors as found in the first model except tuition in order to accommodate data on enrolment, academic programs and major courses from Nursing and Weekend College. Using the mean, the average first-semester college enrolment was, 1,784 students and its average annual growth was a negative 1.3 percent. The computed tuition elasticity was negative 0.89 and typical income elasticity was a negative figure. Using multiple regression analysis, the study found that per capita income and college-bound population were significant predictors of the first model and only academic program was the significant predictor of the second model.

Keywords: *academic programs, enrolment factors, income and tuition elasticities*

INTRODUCTION

Cor Jesu College (CJC), a leading private educational institution in Davao del Sur, relies much on tuition to fund its operation. Its capacity to operate has always been determined to a large extent by college enrolment levels. For instance, as is also true to all other private schools in our country, salary increase of Cor Jesu personnel have always been derived from seventy percent of tuition increase. In the last 20 years of operation, college enrolment figures of Cor Jesu College went through ups and downs-- peaking at a high 2,482 enrolees in academic year 1997-1998 and diving to a low 1,246 in academic year 2005-2006.

Whatever was the enrolment level found the fortune of Cor Jesu College. The important role of enrolment in the operation of CJC has prompted this researcher to investigate variables that affect access to college through review of related literature. Leslie and Brinkman (1987) reviewed 25 studies on the tuition effect of enrolment and drew a general consensus that a \$100-tuition increase in US schools in AY 1982-83 led to a six percent decline in college enrolment for the 18 to 24 year old group. Savoca (1990) concluded that high tuition levels impeded access to college.

The major course offerings and programs of studies can be measures of school's innovativeness and responsiveness to the labor market. Kotler (2005) stated that a market is won by a company's capacity to innovate its product. Academic program of studies and course offerings are so designed first to cater to the requirement of the labor market with a consequential positive impact on enrolment.

Villegas, Abola and Vitor (2001) wrote that quality product is a significant determinant of demand. In the school setting, the number of passers in the board examination projects a quality effect on prospective would-be college entrants. Moreover, most private schools are stepping out of their comfort zones to reach out to prospective student clientele. Such campaign effort ranges from media advertisement (i.e. print, online, TV and radio) to campus-to-campus visitations. Miranda (1997) stated that advertisement, in any form, influences consumer choices.

Hsieh (1993) used multiple regression analysis to conclude that per capita disposable income significantly affects demand for higher education of public institutions in the US. As can be observed, college-age population is seen as a major factor affecting enrolment level.

Thus, the State of California, for instance, anticipated record levels of college enrolment due to the state's increased population of 18 to 24 years old from about 3 million in 1995 to nearly 307 million in 2005. Sicat (1983) defined demand elasticities as measures of responsiveness of consumers to changes in price, income and advertisement. Price elasticity of demand is a negative number which absolute value can either be greater than unity (i.e., highly sensitive to price change) or lesser than unity (i.e., less sensitive to price change). Moreover, he specified expenditure response to income change. He wrote that since most items of expenditure on income increase with income, thus income elasticities have positive values.

Theoretical and conceptual framework

This study was anchored on the demand theory of Villegas, Abola and Vitor (2001). They argued that consumer demand is a function of price and non-price factors. Specifically, the price of a product changes quantity demanded of the product itself. The direction of relationship between the two variables is negative: as price goes up, quantity demanded of a commodity goes down. Non-price factors like wealth, income, population, price of a substitute, quality of the product, advertising and promotion are positive determinants of consumer choices.

Presented in Figure 1 is the conceptual framework showing the variables of the study. In the diagram, predictors like income, population, tuition, major course offering, board passers, advertisement, and academic program of study were the independent variables and first-semester college enrolment of Cor Jesu College was the dependent variable.

First Model

The first model (see Figure 1) used data that excluded enrollees, programs of studies and major courses from Nursing and Weekend College. The reason for such exclusion was tuition differential: tuition for Nursing and Weekend College differed significantly from tuition charged for most of the course offerings of Cor Jesu College. The time frame of the model started from AY 1992-1993 to AY 2008-2009. The general function of the first model is:

$$FSE(1)=f(TUI,MAJOR,PROG,GRP,POP)$$

FSE(1) is first-semester enrolment in the college department of Cor Jesu College

TUI	is tuition per unit in the college department of Cor Jesu College
MAJOR	is the number of major course offerings of the College
PROG	is the number of programs of the College
GRP	is the number per capita regional domestic product in Davao Region
POP	is the yearly population of 17-21 year olds in Davao del Sur

Second Model

The second model (see Figure 1) had excluded an independent variable, tuition, in order to accommodate data on enrolment, programs and major courses from Nursing and Weekend College. The time frame of the second model covered from AY 1998-1999 to AY 2008-2009. The general function of the second model is:

$$ENRO3=f(MAJOR2, PROG 2, ADVER 2, PERCA 2, PAS 2, POP 2)$$

ENRO3	is first-semester enrolment of Cor Jesu College including Nursing and Weekend College
MAJOR	is the number of 4-year and 5-year major courses of the College
PROG	is the number of program of studies of the College
ADVER	is the yearly amount of expenditures of the College
PERCA2	is the per capita regional product in Davao Region
POP2	is the yearly population of 17-21 year olds in Davao del Sur
PAS2	is the number of board passers of Cor Jesu College

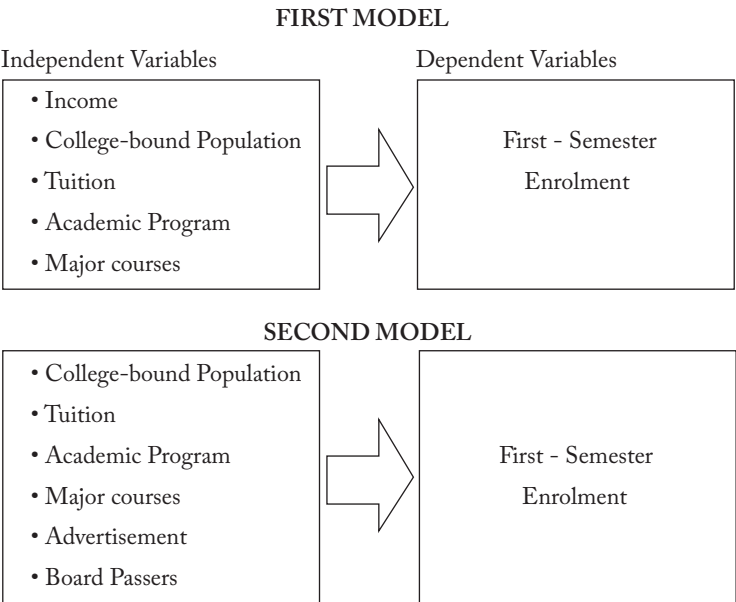


FIGURE 1. Conceptual Framework Showing the Variables in the Study

METHODS

The data of the study came from secondary sources: administrative data of Cor Jesu College and 2007 Philippine Statistical Yearbook. Data on enrolment, tuition, number of major course offerings, number of program of studies, number of board passers and advertisement expenditures were obtained from the Registrar's Office and Treasurer's Office of Cor Jesu College. Other data like per capita income in Davao Region and college-bound population were obtained from 2007 Philippine Statistical Yearbook. This study used mean, percentages and frequency tables to show levels and growth of enrolment. Using elasticity formula, demand elasticities were computed to show sensitivity of enrolment decisions to tuition and income. Multiple regression analysis was used to select predictors that could significantly account for the variation of the dependent variable. The ordinary least-square (OLS) technique was used to estimate the regression function.

RESULTS AND DISCUSSION

Levels and growth rates of first-semester enrolment of Cor Jesu College in the College Department data from AY 1992-1993 to AY 2008-2009 are shown on Table 1. These enrolment data which excluded enrolment in Nursing and Weekend College programs represented the dependent variable of the first model.

The average first-semester college enrolment from AY 1992-1993 to AY 2008-2009 was 1,794 students. From AY 1992-1993 to AY 1997-1998, college enrolment rose by 38.1 percent to 2,482, the highest enrolment by far. The average annual growth of enrolment for the six-period was 7.6 percent, which marked this period as one of relative growth. From AY 1998-1999 to AY 2006-2007, enrolment declined by 50.5 percent to 1,206 – the lowest by far. The yearly average negative growth for the 8-year period was 6.3 percent, marking this period as one of enrolment recession. A glimmer of recovery though showed from AY 2007-2008 to AY 2008-2009 when this period's enrolment growth rates turned positive. Figure 2 showed a long and steep declining course from AY 1998-1999 to AY 2006-2007 and a short-tailed upswing course from AY 2007-2008 to AY 2008-2009. Overall, there were more years of negative growth than years of positive growth – 12 years of negative growth to 4 years of positive growth.

TABLE 1. *First-Semester College Enrolment from AY 1992-1993 to AY 2008-2009*

Academic Year (AY)	First Semester Enrolment	Yearly Growth of Enrolment	
		Increase (+) or Decrease in number of enrollees	% increase (+) or % decrease (+) in enrolment
1992-1993	1,789		
1993-1994	1,794	-3	-0.17
1994-1995	1,772	-22	-1.2
1995-1996	1,757	-15	-0.85
1996-1997	2,331	547	32.7
1997-1998	2,482	151	6.5
1998-1999	2,438	-44	-1.8
1999-2000	2,355	-83	-3.4
2000-2001	2,206	-149	-6.3
2001-2002	1,977	-299	-10.4
2002-2003	1,710	-267	-13.5
2003-2004	1,467	-243	-14.2
2004-2005	1,276	-191	-13.0
2005-2006	1,220	-56	-4.4
2006-2007	1,206	-14	-1.1
2007-2008	1,285	79	6.6
2008-2009	1,429	144	11.2

Graph

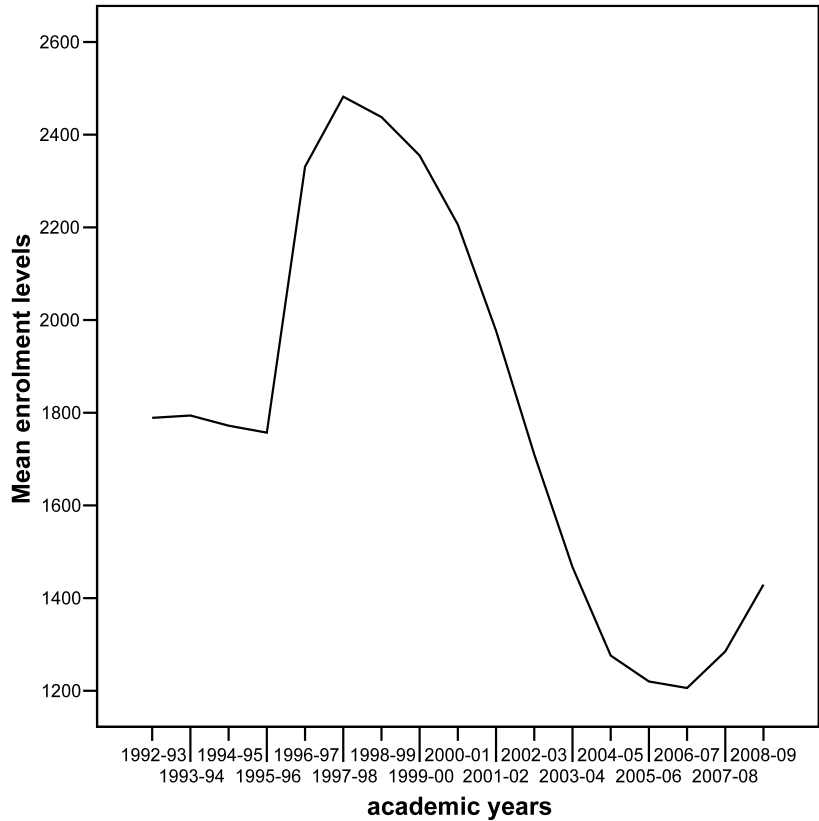


FIGURE 2. CJC Enrolment Patterns from AY 1992-1993 to AY 2008-2009

Tuition elasticity is a measure of sensitivity of students to tuition change. Table 2 showed computed tuition elasticities for the period AY 1993 – 1993 to AY 2008-2009 (see appendix A for computation of elasticities). For the whole study period, the average absolute value of tuition elasticity (0.89) was less than unity to suggest that college students of CJC were generally less sensitive to tuition change. This result would also affirm a desirable cultural trait of Filipinos which is believing that the best legacy parents can bequeath to their children is a good college education.

TABLE 2. *Tuition Elasticity Enrolment*

Academic Year (AY)	First Semester Enrolment	Tuition elasticity** (with appropriate signs)
1992-1993	1,794	Undefined*
1993-1994	1,794	-0.01
1994-1995	1,772	-0.036
1995-1996	1,757	-0.085
1996-1997	2,331	Undefined
1997-1998	2,482	0.66
1998-1999	2,438	-0.18
1999-2000	2,355	-0.16
2000-2001	2,206	Undefined
2001-2002	1,977	-0.306
2002-2003	1,710	-1.35
2003-2004	1,467	Undefined
2004-2005	1,276	-1.9
2005-2006	1,220	undefined
2006-2007	1,206	Undefined
2007-2008	1,285	2
2008-2009	1,429	3.2

* No change of tuition for 2 years such that elasticity is undefined

** Average absolute value of tuition elasticity is 0.89.

However, from AY 2002-2003 to AY 2006-2007, students became sensitive to tuition change. A tuition increase this time had caused disproportionate less of enrolment, which must have resulted to deterioration of tuition income of the school. In fact, for the years that tuition did not increase, enrolment continued to slide. Interestingly, from AY 2007-2008 to AY 2008-2009, elasticities were positive and greater than unity indicating that enrolment rose even when there was tuition increase. It can also be observed that new academic programs – Bachelor of Science in Information System (BSIS), Bachelor of Science in Information Technology (BSIT), Bachelor of Science in Electronic and Communication Engineering (BSECE) and Bachelor of Science in Computer Engineering (BSCoE) – had been introduced during this period. Enrolment in these programs may have improved tuition elasticities from being negative numbers to positive ones, thus violating the theory of price elasticity of demand (Sicat, 1983).

Table 3 showed income elasticities of demand (see appendix B for computation) for college education at Cor Jesu College. From AY 1994-1995 to AY 1998-1999, computed income elasticities of demand were positive to imply that higher per capita incomes in Davao Region raised enrolment in Cor Jesu College. Income elasticities though registered negative from AY 2000-2001 to AY 2006-2007. The result opposed the income elasticity theory of Sicat (1983) – as income rises, so does one's expenditures on many items, education included.

TABLE 3. *Income Elasticity of Enrolment*

Academic Year (AY)	First Semester Enrolment	Income Elasticity
1994-1995	1,772	
1996-1997	2,331	26.25
1998-1999	2,438	2.30
2000-2001	2,206	-1.90
2002-2003	1,710	3-.40
2004-2005	1,276	-2.30
2006-2007	1,206	0.85
2008-2009	1,429	2.80

It is well to recall those computed tuition elasticities that also worsened during the period AY 2000-2001 to AY 2006-2007. A partnership of these two deteriorating elasticities (i.e., income and tuition elasticities) pose some serious challenges to stakeholders of Cor Jesu College on how to arrest this enrolment decline and bring it back to its upswing course.

These challenges though had been met head-on when the school launched four new academic programs in AY 2007-2008. Around this period, student recruitment intensified sending college professors to many high schools in Davao del Sur to help make a marketing pitch for Cor Jesu College. This effort to fill up the college campus of Cor Jesu College bore fruit when income elasticity in AY 2008-2009 swung back to a positive number.

In the first model, at 5 percent level of significance, Table 4 showed regression function which was significant and able to explain 77.8 percent of the variation of college enrolment in the school. Of the 5 factors, only college-bound population and per capita income were significant predictors of enrolment. The estimated positive coefficient of college-bound population specified that a yearly increase of the population by a thousand would raise college enrolment by 107 students. This result affirmed an economic principle that a population is a determiner of demand (Villegas, Abola and Vitor, 2001). Income measured by per capita income in Region XI, turned out to be a significant predictor of enrolment. This result was similar to the finding of Shim (1990) but for the direction of relationship between income and enrolment. The result, which showed a significant negative influence of income on Cor Jesu College enrolment, was interesting as it went against the expected relationship between income and enrolment--being positive. To explain it, this study wanted to offer a couple of observations. First, Cor Jesu College enrolment declined continuously from AY 1997-1998 onwards and it was around this period when the Nursing profession was most financially rewarding. With a growing perception on a strong international demand for Filipino nurses, parents here were sending their children to Nursing schools even at a higher cost of education. Thus, increasing incomes may have encouraged many parents to forego traditional courses many of which were offered by Cor Jesu College in favor of high-income courses like Nursing and other – attractive courses which were not yet offered then by Cor Jesu College. Second, an increasing income may have encouraged parents and children to choose Davao City or highly urban cities as highly desired places to study and pursue attractive college courses like Nursing, and Hotel and Restaurant Management.

TABLE 4. *Multiple Regression on Predictors of the First Model and College Enrolment in Cor Jesu College*

Predictors	Estimated Coefficient	Standard Error	P-Value	Constant	r ²	F-Value
Income	-.409	.113	.001	-824.912 (p-value = .787)	.778	8.401 (p-value = .001)
College-Bound Population	.107	.046	.039			
Tuition	-2.516	3.630	.537			
Number of Program of Studies	68.036	84.185	.203			
Number of Major Offerings	-34.477	58.422	.195			

In the second model, at 5 percent level of significance, Table 5 showed a regression function which was significant and could explain a large 96.6 percent of the total variation of enrolment. Academic program was the only significant predictor and its estimated coefficient suggested that introduction of an academic program increased enrolment by 185 students. This result affirmed the principle of innovative marketing of Kotler (2005) showing companies which continuously seek real product and marketing improvement will win the market away from those companies that do not innovate and improve.

TABLE 5. *Multiple Regression on Predictors of the Second Model and College Enrolment in Cor Jesu College*

Predictors	Estimated Coefficient	Standard Error	P-Value	Constant	r ²	F-Value
Board Passers	-.480	1.976	.818	5538.57 (P-value = .191)	.966	23.864 (p-value = .002)
Advertisement	-.002	.001	.085			
Income	-.175	.234	.487			
Academic Program	184.90	40.614	.006			
Population	-.020	.081	.814			
Major Courses	-40.77	50.295	.454			

It may be recalled that program of studies – excluding Nursing and Weekend College Programs – did not register as a significant predictor in the first model. When these two programs were factored into the second model, academic program became a significant predictor of enrolment. When Weekend College Program was first introduced in AY 2005-2006, it increased college enrolment by 5 percent and further increased it by 14 percent in the succeeding academic year. Together with the Nursing Program introduced in AY 2007-2008, Weekend College Program raised enrolment by 25 percent in AY 2007-2008 and by 32 percent in AY 2008-2009.

CONCLUSIONS

Based on the findings of the study, the following conclusions were made:

1. First Model
 - 1.1 The average first-semester college enrolment was 1,794 students.
 - 1.2 The average annual growth of college enrolment was a negative 1.3 percent.
 - 1.3 Cor Jesu College students were less sensitive to tuition change.
 - 1.4 A typical income elasticity was a negative income elasticity.
 - 1.5 Income and college-bound population were significant predictors of college enrolment.
2. In the second model, academic program of studies was a significant predictor of college enrolment.

Appendix A

Computation of tuition elasticities

$$\text{Formula: } ed = \frac{\Delta Qd / Qd1}{\Delta P / P1}$$

Where ΔQd = change in enrollment between 2 consecutive academic years

ΔP = tuition change between 2 academic years

$$1. \quad \frac{\frac{1797 - 1797}{89.85 - 77.85}}{\frac{-3}{77.85}} = \frac{0}{.154} = 0.154 = -0.011$$

$$2. \quad \frac{\frac{1772 - 1794}{120 - 89.85}}{\frac{-0.012}{89.85}} = \frac{0.336}{0.336} = -0.036$$

$$3. \quad \frac{\frac{1757 - 1772}{132 - 120}}{\frac{1}{120}} = \frac{-0.0085}{0.1} = -0.085$$

$$4. \quad \frac{.065}{0.098} = -0.66$$

$$5. \quad \frac{-0.018}{0.103} = -0.175$$

$$6. \quad \frac{-0.034}{0.2125} = -0.16$$

$$7. \quad \frac{\frac{1977 - 1977}{260 - 194}}{\frac{2}{94}} = \frac{0}{0.3402} = 0.104$$

$$8. \quad \frac{\frac{1710 - 1977}{306 - 286}}{\frac{1}{260}} = \frac{-0.135}{0.1} = -1.35$$

$$9. \quad \frac{\frac{1276 - 1467}{306 - 286}}{\frac{1}{286}} = \frac{-0.130}{0.07} = -1.9$$

$$10. \quad \frac{\frac{1285 - 1206}{316 - 306}}{\frac{1}{306}} = \frac{0.066}{0.033} = 2$$

$$11. \quad \frac{\frac{1429 - 1258}{327 - 316}}{\frac{1}{316}} = \frac{0.112}{0.035} = 3.2$$

Appendix B

Computation of Income Elasticities

$$\text{Formula: } ed = \frac{\Delta Qd / Qd1}{\Delta Y / Y1}$$

Where ΔQd = change in enrollment between 2 consecutive academic years
 ΔY = change in per capita income between 2 consecutive academic years

1. ey2 $\frac{\frac{2\,331 - 1\,772}{1\,772}}{\frac{10\,379 - 10\,254}{10\,254}} = 26.25$
2. ey3 $\frac{\frac{2\,438 - 2\,331}{2\,331}}{\frac{10\,742 - 10\,529}{10\,529}} = \frac{0.046}{0.02} = 2.30$
3. ey4 $\frac{\frac{2\,206 - 2\,438}{2\,438}}{\frac{11\,270 - 10\,742}{10\,742}} = \frac{0.095}{0.049} = -1.94$
4. ey5 $\frac{\frac{1\,710 - 2\,206}{2\,438}}{\frac{12\,019 - 11\,270}{11\,270}} = \frac{0.225}{0.066} = -3.40$
5. ey6 $\frac{\frac{1\,276 - 1\,710}{1\,710}}{\frac{13\,455 - 12\,019}{12\,019}} = \frac{0.225}{0.119} = -0.85$
6. ey7 $\frac{\frac{1\,706 - 1\,276}{1\,276}}{\frac{14\,336 - 13\,455}{13\,455}} = \frac{-0.055}{0.065} = -0.85$
7. Ey8 $\frac{\frac{1\,429 - 1\,206}{1\,206}}{\frac{15\,268 - 14\,336}{14\,336}} = \frac{0.185}{0.065} = 2.85$

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