Factors That Impact Marriage Duration

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April 4, 2022

1. Research Question

What are the factors that impact the marriage duration of divorced couples in Mexico?

We aim to investigate the correlation between the marriage duration of divorced couples in Mexico as the dependent variable and the demographic factors such as partners' age, partner's monthly income, partner's education level, type of divorce, number of children, child custody as independent variables.

2. Data:

The dataset, found on Kaggle, is the Mexican government official dataset on divorces from 01-01-2000 to 31-03-2015 in Xalapa, Veracruz, Mexico. There are 3,430 observations in total and the data points are in Spanish, but the names of variables are translated to English. The independent and dependent variables are defined as below:

- Marriage duration: The legal marriage period from the date of marriage registration to date of divorce in years. This is calculated from the raw data in the original dataset.

- Husband's age: Age of husband at the date of divorce in years. This is obtained from their date of birth in the dataset.

- Wife's age: Age of wife at the date of divorce in years. This is obtained from their date of birth in the dataset.

- Husband's monthly income: Monthly income of husband in pesos.

- Wife's monthly income: Monthly income of wife in pesos.

- Husband's education level: A qualitative categorical variable measures the level of education completed by the husband. There are 5 categories: (0) Primaria: completed primary school (1) Secundaria: completed secondary school (2) Prepatoria: completed high school (3) Professional: completed any higher education level, having either an undergraduate or graduate degree (4) Sin Escolaridad: Without any schooling

- Wife's education level: A qualitative categorical variable measures the level of education completed by the wife. There are 5 categories: (0) Primaria: completed primary school (1) Secundaria: completed secondary school (2) Prepatoria: completed high school (3) Professional:

completed any higher education level, having either an undergraduate or graduate degree (4) Sin Escolaridad: Without any schooling.

- Type of divorce: A qualitative categorical variable indicates the two types of divorce: (0) Necessary - Necessary divorce means there is disagreement regarding the divorce between the spouses or when one of the parties does not accept the divorce, (1) Voluntary - There is mutual consent or both spouses agree to the divorce (Immigration and Refugee Board of Canada).

- Number of children: Number of children that they have together.

- Child custody: A qualitative categorical variable indicates the person who gets the legal right and obligation to decide on the child's upbringing. There are 3 categories: (0) Mother, (1) Father, (2) Other.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
husbandage	3412	39.125	9.978	19	78
husband_mincome	3430	10370.876	61301.332	3	3150242
wifeage	3354	36.603	9.569	18	78
wife_mincome	2468	7456.202	17259.506	3.5	708652
marriageduration	3430	11.349	9.026	1	60
children	2171	1.794	.883	1	7
husbandedu	3397	2.281	.963	0	4
divorcetype	3430	.546	.498	0	1
wifeedu	3298	2.309	.937	0	4
custody	1584	.032	.203	0	2

3. Preliminary Plan

Based on our research question, the starting model is:

$$marriageduration = \beta_0 + \beta_1 husbandage + \beta_2 husbandmincome + \beta_3 wifeage + \beta_4 wifemincome + \beta_5 husbandedu + \beta_6 wifeedu + \beta_7 divorcetype + \beta_8 children + \beta_9 custody + \epsilon$$

We would compare different models by omitting each of the variables and running a regression for each model. This could be done by running checking multicollinearity between variables.

4. Literature Review

Since divorce has legally existed in Mexico, the divorce rates have exhibited an upward trend in past decades, and many believe that the introduction of unilateral divorce, along with the mutual-agreement divorce provision, caused the remarkable growth in divorce rate. Previous studies (Aguirre, 2019) (Lew et al., 2008) researched the effect of adopting unilateral divorce provision on the divorce rate in the Latin American country Mexico. Besides the effect of unilateral divorce policy, other factors that may influence divorce rate in Mexico have been rarely discussed. Thus, it is essential to take the influence of age, income, education, number of children, and child custody into consideration, all of which represents the quality of marriage. Our research would provide insights on to what degree the marriage duration of divorced couples is influenced by these factors in Mexico.

Husband's age & Wife's age: According to a research of BGSU national center for family and marriage research (Allred, 2019), the rate of divorce declined with the age of marriage in the US. Thus, we deduce that a similar trend would occur across different age groups in our dataset.

Husband's monthly income & Wife's monthly income: A research about divorce rate in Sweden (Liu & Vikat, 2008) sheds light on the effect of income on the divorce rate. They found out that the higher the wife's share in the couple's income the higher the divorce risk. However, the research has also found that when the combined income of the household is higher then there is generally a lower risk of divorce.

Husband education level & Wife's education level: A research by Pew Research Center (Wang, 2015) indicates that college-educated women are more likely to have a long lasting relationship compared with that of the women who have a high school degree or less. Thus, we expect a negative correlation between education level and divorce rate.

Number of children: A 2015's research on the effect of children on the divorce rate in China (Xu et al., 2015) concluded that the higher the number of children, the more stable the marriage. We expect a similar relationship found out in our research.

Child custody: Current research mainly focuses on the emotional effect of divorce on children and their future development, but rarely discusses the effect of child custody on the divorce. We hope we could find some insights from the dataset to further discuss the relationship.

Researching these factors that influence the marriage duration of couples will allow us to assess what are the variables that escalate or de-escalate the process of a married couple arriving to the stage of divorce. Such understanding can allow policy makers to alleviate social problems or factors that cause divorce. Similarly, policy makers can provide assistance so that the marriage duration is shortened for a divorcing couple in the case where a longer duration of maintaining the marriage causes suffering of any of the family members. For example, let's say a mother who is suffering from domestic violence wants a divorce but is unable to do so because of her financial instability. If the government can provide some sort of

financial support or job security, the mother could quickly get a divorce without having to endure the suffering and choosing divorce as a last resort.

5. **Methodology**:

$$marriageduration = \beta_0 + \beta_1 husbandage + \beta_2 husbandmincome + \beta_3 wifeage + \beta_4 wifemincome + \beta_5 husbandedu + \beta_6 wifeedu + \beta_7 divorcetype + \beta_8 children + \beta_9 custody + \epsilon$$

We start our analysis with a simple regression model and take out the independent variables that are not statistically significant. Such variables are husband's monthly income, wife's monthly income, divorce type, and custody.

From the number of observations listed at the bottom of the regression table (Table 2), it shows that the number of observations are different for all five regressions.

Table 2. Five regression models

	(1)	(2)	(3)	(4)	(5)
	marriageduration	marriageduration	marriageduration	marriageduration	marriageduration
husbandage	.224***	.226***	.199***	.224***	.251***
	(.028)	(.028)	(.024)	(.028)	(.028)
husband_mincome	0		0	0	0
	(0)		(0)	(0)	(0)
wifeage	.352***	.35***	.378***	.35***	.464***
	(.03)	(.03)	(.026)	(.029)	(.029)
wife_mincome	0	0		0	0
	(0)	(0)		(0)	(0)
children	2.197***	2.196***	1.774***	2.201***	1.753***
	(.185)	(.185)	(.153)	(.185)	(.177)
husbandedu	-.518***	-.516***	-.246*	-.521***	-.439***
	(.165)	(.165)	(.141)	(.165)	(.16)
divorcetype	.114	.111	.233		.902***
	(.26)	(.26)	(.232)		(.252)
wifeedu	-.494***	-.491***	-.521***	-.493***	-.324*
	(.179)	(.179)	(.145)	(.179)	(.173)
custody	.538	.535	.937	.56	
	(.749)	(.749)	(.615)	(.747)	
_cons	-11.117***	-11.133***	-10.96***	-11.029***	-15.866***
	(.761)	(.761)	(.649)	(.734)	(.69)
Observations	1078	1078	1466	1078	1480
R-squared	.603	.603	.589	.603	.681
Adj R^2	.6	.6	.586	.6	.679

Standard errors are in parentheses *** *p<.01,* ** *p<.05,* * *p<.1*

$$\widehat{marriageduration} = 0.224\ husbandage + (0)husbandmincome + 0.352\ wifeage + (0)\ wifemincome - 0.518\ husbandedu - 0.494\ wifeedu + 0.114\ divorcetype + 2.197\ children + 0.538\ custody - 11.117$$

On average, with one unit increase in the husband's age, the marriage duration increases by 0.224 years with all other variables constant and all else equal. On average, with one unit increase in the wife's age, the marriage duration increases by 0.352 years with all other variables constant and all else equal. On average, with one unit (stage) increase in the husband's education, the marriage duration decreases by 0.518 years with all other variables constant and all else equal. On average, with one unit (stage) increase in the wife's education, the marriage duration decreases by 0.494 years with all other variables constant and all else equal.

On average, ceteris paribus, the estimated coefficients for husband and wife's monthly income are 0 because the regression result reported such a small value that when rounded to 3 decimal places, the coefficients are approximately equal to 0. Another reason for this is that the range of the two variables are too large and there might be outliers. We will discuss the plan to fix this in the next section.

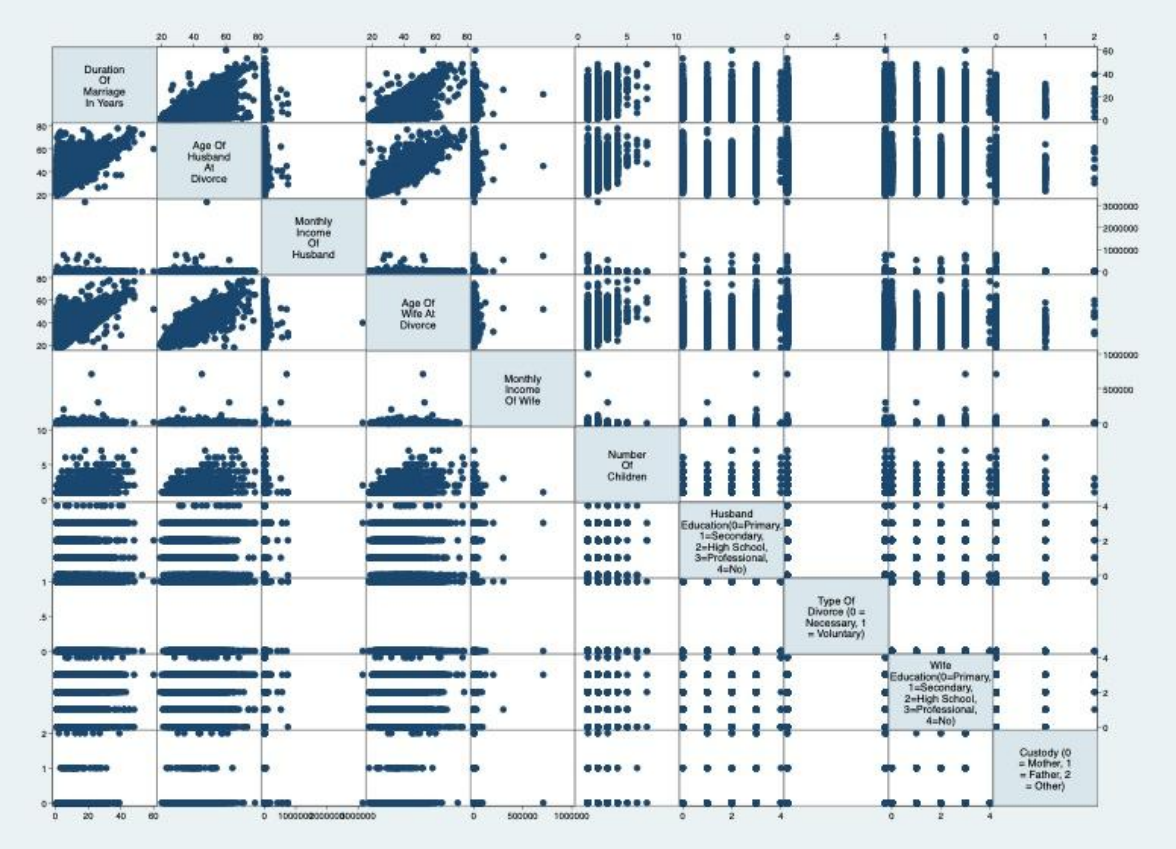

Figure: graph matrix of above regression

The graph matrix shows how the observations are distributed according to the independent variables. We can observe an overview and the relationship between the dependent with each independent variable.

a. Multicollinearity:

We also checked the multicollinearity between variables. The table shows that there are no multicollinearity we should be concerned about.

Table 3. Variance inflation factor

	VIF	1/VIF
wifeage	3.18	.314
husbandage	3.118	.321
wifeedu	1.454	.688
husbandedu	1.417	.706
children	1.234	.81
divorcetype	1.041	.961
custody	1.02	.98
husband mincome	1.005	.995
Mean VIF	1.684	.

b. Homoskedasticity:

We checked for heteroskedasticity using white test. The p-value from the chi-square test (0.000) is smaller than 0.05, so our model did violate the homoskedasticity assumption. We can fix this problem by robust error for the next update.

Table 4. White Test

White's test H0: Homoskedasticity Ha: Unrestricted heteroskedasticity chi2(43) = 133.69 Prob > chi2 = 0.0000 Cameron & Trivedi's decomposition of IM-test chi2	df	p
133.690	43	0.000
30.470	8	0.000
12.730	1	0.000
176.900	52	0.000

6. Next Plan:

The husband and wife's monthly income variables in our model have a very large range, which could be the reason why the effects of husband and wife's monthly income on marriage duration are not statistically significant. We plan to categorize monthly income into brackets of income with increments of 10000 pesos to potentially identify and fix any effect that an outlier data point might have on the regression. We expect this to improve the p-value of the two variables.

Moreover, custody, children, and wife's monthly income have a lot of missing values. We will investigate further to see if the missing data is random or non-random to decide what to do next. If the missing data is random, we can leave it as it is. But if the missing data is the result of sample selection bias, we need to use the Heckit method to fix the problem.

We also expect that divorce type would have a statistically significant effect on marriage duration, but our preliminary regression model reported a large p-value of 0.26 for divorce type. We can read more literature reviews to explain this effect.

7. References (APA)

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