

Female Labor Force Participation in Formal Sector: An Empirical Evidence from PSLM (2007-08)

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Abstract: The present study is based on socio-economic and demographic factors and focused on the proportion of educated females' participation in labor force. Binary logistic regression is utilized to determine the factors affecting female labor force participation in formal sector. The data collected by the PSLM (Pakistan Social and Living Standards Measurement Survey, 2007-08) about the individual and household characteristics of females between the ages of 21-60 years are used for analysis. Empirical results suggest that secondary and tertiary education plays a significant and positive role in females' decision to participate in formal sector. The results also indicate that females' participation in formal sector is highly correlated with the MPhil/PhD or a professional/postgraduate degree. Moreover, females are more likely to participate if they are married, living in urban area and belong to a nuclear family with many sisters., Whereas the age of females, presence of boys at home and female as a head of the household reduces the probability of females' participation in formal sector.

Key words: Female labor force participation • Female education • Formal sector • PSLM • Odds ratio

INTRODUCTION

From the pioneering works of Mincer [1] and Cain [2], researchers are engrossed to scrutinize economic analysis of female labor force participation. The female labor force participation rates have been increased considerably in the developed countries in recent years. In contrast, the declining trend of the female labor force participation rate is found in many developing countries. Pakistan's economy has been down sliding in recent past which has affected the living, working and employment opportunities for both male and female, but the females have suffered more in these circumstances. It has been analyzed that especially women need to work more and more in order to contribute to the family income and have to work longer hours to keep themselves and their families above the poverty threshold.

Pakistan Employment Trend (2009) has found that female inactivity decreased in Pakistan in line with growing employment shares in the female population and decreasing unemployment rates for the same, during the last decade. The opportunity cost of leaving traditional unpaid family care duties such as housework and childcare to seek work in a male oriented job market is far

too high for the majority of women. In addition, female labor force participation is still a challenge in some parts of the country [3].

Researchers have found that women status in the society can be measured through their employment. It is also investigated that female participation in labor force is coexisting with a dynamic growth process within the economy. In developed economies, researchers seek to measure women's well-being by examining factors influencing women's labor force participation.

Human capital is considered as an important determinant of economic growth which is an effective vehicle for reducing income inequality and absolute poverty [4]. The numbers of studies have examined the role of human capital as an important determinant of economic growth. This is supported by empirical studies that human capital (such as years of schooling, school enrolment rates, or literacy rates) have statistically significant and positive effects on economic growth e.g., [5-9].

In developed economies education is considered as key determinant of employment and their wages but in developing countries, earnings in the paid labor force outside the household are often not a major source of

family earning [10]. Neoclassical economists consider education as one of the key determinants of women's earning and labor market. Many studies have proved that return to education among women is higher than men. According to PIHS (1999), the slope of education earning relationship for women is three times steeper than for men. The study concluded that the return to completed years of schooling attainment in wage work ranges between 7 to 11 percent for men and between 13 to 18 percent for women. So the findings of the study suggest that women have significantly higher economic incentives to invest in education than men [11].

The Females Labor Force Participation in Pakistan:

Pakistan Employment Trends 2011, analyses Pakistan's progress in creating "full and productive employment and decent work for all, including women and young people", as a prerequisite for achieving MDG-1, to eradicate extreme poverty and hunger by 2015. In line with a growing labor force participation rate (from 50.4 percent in 1999-2000 to 52.5 percent in 2006-2007 and 53.4 percent in 2010-2011), the employment to population ratio has steadily increased over the last ten years (from 46.8 percent in 1999-2000 to 50.4 percent in 2010-2011), especially for women, (from 13.7 percent in 1999-2000 to 22.2 percent in 2010-2011) reflecting the Government's efforts to create more employment opportunities for all. Overall, men seem to benefit more from improvements in the labor market. In 2010-2011, the share of men with a wage and salaried job was at 41.2 percent; almost double that of females, at 21.6 percent, reflecting a situation in which the few wage and salaried jobs that are created tend to go to men rather than women. Roughly six out of ten employed people in Pakistan (61.6 percent) in 2010- 2011 were considered to be vulnerable, meaning "at risk of lacking decent work". Beside the large share of female vulnerability (78.3 percent) needs special attention, the large share of youth vulnerability (60.9 percent) also needs consideration., young people (often better skilled than the rest of the labor force) seem to face similar labor market difficulties as adults. Pakistan has seen very low labor productivity over the last decade. In addition the relatively low growth in labor productivity has not gone hand in hand with the increasing labor force and employment growth. This development suggests that many new labor market entrants are taking on low-productivity, poorly remunerated work [12].

The Females Labor Force Participation in Formal Sector in Pakistan: Females' labor force participation has

increased in formal and informal sector during the past years. According to *Labor Force Survey* 2008-09, the females' participation in manufacturing and service sector has increased by one percent and participation in agriculture sector has decreased by one percent from 2007-08 to 2008-09. Moreover, the survey explicates that total labor force participation in formal sector has fallen because of the informalization in the agriculture sector from 2000-08. There has been a trend of self-cultivation and a decline in share tenancy. On the other hand, the participation of females in formal sector has been increased by 32.5 percent to 32.8 percent from 2008-09.

The review of wage data available in the Labor Force Survey shows enormous wage discrepancies for male and female employees in average real wages. In 2008, women generally earned almost one third less than their male counterparts. In addition, the wage gap significantly widened since the beginning of the decade, in particular during the most recent survey years. Further, among the few women working in wage and salaried employment, a status considered to be more secure, almost six out of 10 women were engaged in casual or piece rate work 56.8 per cent in 2008 [13].

Objectives of the Study: The purpose of this study is to:

- Explicate the factors of females' participation in economic activity,
- Empirically corroborate the factors of females' participation in formal sector in Pakistan's labor force. Therefore, the present study has following objectives.
- To what extent females in Pakistan are likely to participate in labor force?
- To analyze the females' participation in formal sector with reference to their demographics as age, marital status, etc.
- To analyze the impact of women's education on females' labor force participation and decision making in formal sector.
- To analyze the likelihood of the labor force participation of educated women being affected by the household size and its composition (number of boys and girls)?

Literature Review: Jacob Mincer (1962) focused on the factors affecting female participation in economic activity. The results showed that factors like husband's income and an increase in real income is adversely affecting female labor supply. The participation of married females

increases with the increase of real income. The study concluded that number of children is significantly affecting female labor force participation decision [1]. Kozel and Alderman (1990) investigated the features affecting women participation in economic activity by using Tobit model. The results of the study indicated that women participation in economic activity increases with the increase in wages and level of education. Moreover, it was analyzed that the presence of male members in the family is negatively correlated with female labor supply [14].

Aly and Quisi (1996) conferred various socio-economic components affecting women work participation decision in Kuwait. The study concluded that wage rate and education level are positively affecting female participation in economic activity. Furthermore, it was concluded that some factors as marital status, number of children and age are inversely related with labor force participation of females [15].

Flynn and Oldham (1999) in "Women Economic Activities in Jordan" estimated that females' participation in economic activity is very low as compared to males. Moreover, the study explores that education and marital status are key determinants of female labor force participation. The study concludes that females in early age (twenties and thirties) have more probability to participate in labor force, so the findings reveals that unmarried women have less time constraints and domestic responsibilities than married women. Moreover, the study explores that educated females participation in formal sector is four times more than females with secondary education [16].

In Pakistan Azid *et al.* (2001) studied the factors influencing female labor force participation and analyzed it in the informal sector of embroidery in Multan. The study explored that the age of females, number of children and education of female positively affects female participation in economic activity [17]. Naqvi and Shahnaz (2002) have analyzed the aspects affecting female labor force participation. The study examined various demographic, socio-economic and human capital related factors by using data from household survey. The scholars estimated the parameters by applying Probit and Logit model. The study revealed that female participation was positively affected by their education level, if they were living in rural areas and the head of the family was literate. Some factors as their younger age, poor education and their dependence on family head were economic activity [18].

Munoz (2007) analyzed women in the Venezuelan labor market, focusing on their labor force participation and their income. Among the factors that influence Venezuelan women's labor force participation, the authors pointed out, are income level, education and the development of political and social institutions. Age is also important: the highest labor force participation, 46 percent, is observed for those between the age of 30 and 39 [19].

Ahmad and Hafeez (2007) examined determinants of female participation in economic activity of married women in Pakistan. The data were collected from 201 women. The data were analyzed by Logit and Probit model to find the estimates. The study concluded that education is the main factor of female labor force supply and wages. Another factor is family position. Females from poor families were more likely to participate. Joint family system was also positively affecting female work participation in economic activity. Moreover, the educational level of husband, mothers and fathers did not influence female decision in labor force [20].

Ejaz (2007) studied the major determinants of female labor force participation specifically with reference to rural and urban areas in Pakistan. The data PSLM (Pakistan Social and Living Standards Measurement Survey, 2004-05) for the analysis comprised of working women aged 15-49. The study concluded that female labor force participation increases with the increase in age, woman's education and marital status especially if she is unmarried. Furthermore, study explores that woman belongs to nuclear family, having less number of children, has access to a vehicle, is more likely to participate in the labor force. Moreover, females' participation in the labor force will be low if they have the availability of home appliances [21].

Faridi *et al.* (2009) interpreted some components of female work participation based on cross-sectional data collected through field survey. The Logit model was applied for estimation. They found that secondary school or higher level of education had positive impact on female's labor force participation. Moreover the study concluded that married females aged between 25-34 and 45-54 years, presence of educated husband and number of children influenced the women work participation positively and significantly. Women of young age group (15-24 years), presence of household assets, spouse participation in economic activities and presence of infants reduced the women work participation in economic activities [22].

The most of the studies have focused on the labor force participation of less educated females, while the role of educated females is being neglected by the researchers. On the other hand, it has been approved by the study that women have higher incentives to invest in education than men. The study concludes that returns to completed years of schooling attainment in wage work for women is higher (13% to 18%) as compared to men (7% to 11%), while the intercept of the regression is much higher for men because they enjoy earning premiums over women at all levels of education (Aslam, 2009) [11].

Ismail and Jajri (2012) analyzed gender wage differentials and labor market discrimination in Malaysia. They found that female participation is low than that of males, even though they are equally educated [23].

It is expected that present study will contribute to the economic literature in a significant way by improving upon the previous studies and also identifying the factors affecting the females' labor force participation.

Source of Data: The study utilizes micro data of PSLM (Pakistan Social and Living Standard Measurement Survey, 2007-08) of Federal Bureau of Statistics, the agency of Pakistani Government that collects data and generates official statistics.

For the purpose of this study the sample is restricted to women between 20-60years.

Model Specification: Linear probability model cannot be used by researcher because of limited or qualitative nature of the observed dependent variable and most of the variables used by researcher are binary variables. Therefore, non-linear specification may be more appropriate. The Logit model is used to estimate females' labor force in formal sector as used by [19-21]. In Logit model, the dependent variable is FLFP (Female labor force participation). The FLFP is a function of several explanatory variables and it is a binary variable which takes value '1' for FLFP in formal sector and '0' otherwise. General equation of the function is:

$$Y_i = F (X_1, X_2, \dots, X_n)$$

where, Y_i denotes FLFP (Female labor force participation). X_1, X_2, \dots, X_n represent various determining factors leading to female participating in the labor force.

$$y_i^* = \beta_0 + \sum \beta_j X_{ij} + \epsilon_i$$

where y_i is not observed. It is a dummy variable. y_i defined by

$$y_i = 1 \text{ if } y_i^* > 0 \\ = 0 \text{ otherwise}$$

y_i is equal to 1 if the female participates in economic activity and equal to zero if she does not. β is a row vector of parameters and ϵ is normally distributed with mean 0.

The Logit Model will be as:

$$P[\text{female work in formal sector}] = \frac{1}{1 + e^{(-\beta X_i)}}$$

In the Logit version P is the probability of a binary outcome (1,0), taking the value 1 for the female if she participates in economic activity and 0 otherwise.

$$Z = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \epsilon_i$$

with X as explanatory variables. The regression may be derived from the logistic probability equation (1):

$$\ln (P/1-P) = -\beta X_i$$

Let:

$$P_i = \Pr(Y=1 / X=X_i)$$

Then we can write the model:

$$P_i / (1-P_i) = \exp(\beta_0 + \beta_1 X_i)$$

In our example P_i is the probability of females' participation in economic activity and X_i is the factors affecting females to participate in labor force. Therefore the parameter β_0 gives the *log* odds of a female participating in labor force (when $X_i = 0$) and β_1 shows how these odds differ, when other factors influence females' decision.

Variables: Women labor force participation is a dependent variable and takes the binary form as '1' for women participation and '0' for not participation in formal sector.

Independent Variables: Three main categories of variables to explain women participation in economic activity are Individual and demographic factors (age, education, marital status), socio-economic condition factors (head of household, per capita income of the household, number of dependents, household type), geographic location factors (urban and rural residence).

Table1: Description of Variables

Variables	Definition
FLFP(Female Labor Force Participation in formal sector)	= 1 if female participates in formal sector '0' otherwise.
Age	= female's age in completed years.
Edu1	= 1 if female's education level is up to primary and '0' otherwise.
Edu2	= 1 if female's education level is up to matric and '0' otherwise.
Edu3	= 1 if female's education level is up to MA/MSc and '0' otherwise.
Edu4	= 1 if female's education level is up to M.Phil/Ph.D or a professional degree and '0' otherwise.
MS	= 1 if female is married and '0' otherwise.
HHsize	Number of household/family members.
No. of Boys	Number of boys = 10 years in the household.
No. of Girls	Number of girls = 10 years in the household.
FmH	= 1 if female is the head of the household and '0' otherwise.
Per Cap I	Household per capita income (in 00 Rupees) per month.
HHType	= 1 if female belongs to a nuclear family and '0' otherwise.
HHLocality	= 1 if female lives in Urban area and '0' otherwise.

Table 2: Description of Variables

Demographic Variables	Frequency	Percent
Gender		
Male	54153	50.5
Female	53054	49.5
Total	107207	100.0
Age of		
21-40	14282	65.4
41-60	7563	34.6
Total	21845	100.0
FLFP		
Not Participating	15673	71.7
Participating	6172	28.3
Education		
Uneducated	15925	72.9
Primary(0-5)	1943	8.90
Matriculation(6-10)	2614	12.0
Masters(11-16)	1239	5.7
Post Pro(17-30)	124	.60
FLFP in Formal Sector		
Informal Sector	20577	94.2
Formal Sector	1268	5.8

Source: Pakistan Social and Living Standards Measurement Survey (2007-08)

Table 3: Estimates of Logit Regression

Independent Variables	B	S.E.	Exp(B)
Age	-0.009	0.008	.991
Primary	0.217	0.261	1.243
Matriculation	0.358	0.203	1.430
Masters	-0.248	0.364	0.781
Post Professional	1.766	0.884	5.850
Marital Status	0.215	0.210	1.239
Household Size	0.035	0.027	1.036
No. of Boys	-0.020	0.062	0.980
No. of Girls	0.029	0.062	1.029
Fm Head	-0.039	0.346	0.961
Per Cap I	0.000	0.000	1.000
HH Type	0.198	0.233	1.219
HH Locality	0.014	0.181	1.014
Constant	-2.646	0.461	0.071

Log-Likelihood = 546.498 Cox & Snell R Square = .113

Number of Observations = 1819 Chi-Square (8 df) = 13.13

Wald Statistic = 1.801

Source: Calculated by the author from PSLM (2007-08)

Estimates of Logit Regression: Total number of household from all the four provinces of the country included in the survey are 1, 07,207. For the analysis the whole data can be used as there is no missing value.

The Table 2 represents that, the data includes 50.5 percent of male household and 49.5 percent comprised of females. The sample available for analysis includes 53,054 females aged 0-99 years. The data for the analysis comprised only the females aged (21-60) years participating in economic activity and hence contributing in the household income. It is clear from the table given above that maximum number of employees was in the age group (21-40) and that is 65.4 percent of the total females of sample selected for analysis. The table reveals that 6,172 females are participating in economic activity out of 21,845 females in the working age group (21-60), which defines that labor force participation rate of females is 28.3 percent of the total females in the working age group (21-60) year.

Moreover, the results explain that the large number of females is not participating in labor force.

Table shows that the years of education are categorized in different education ranges. The table reveals that 72.9 percent of the total females (21-60) years are not educated. Moreover, 8.9 percent of total females in the above age group have maximum five years of schooling and 12 percent have passed matriculation. 5.7 percent of the subgroup of females has maximum education at university level (sixteen years of education). Finally less than 1 percent, only 0.6 percent of the subgroup, has higher degrees or professional degrees. Table presents the data of females working in the formal and informal sectors. The occupational categories show that 8.1% females are working in agriculture and fishery sector while 7.4 percent of working females is running their lives as laborers, street vendors, cleaners and

garbage collectors, which are low paid jobs. The table shows that maximum percentage of working females i.e. 94.2% is associated with the informal sector that is more deprived.

Age: It is found that for the women in the age bracket of 20-60 years, there is a negative relationship between the age of women and her probability of participation in formal sector of labor force and it has insignificant impact on females' participation in labor force. The Beta value -0.009 indicates that as the age of women increases, they are less likely to participate in economic activity and in the formal sector. The odds ratio of the age coefficient is presented by Exp (B) and it takes the value 0.991, a value less than 1. It shows that with an additional year of age, the female's participation in formal sector will decrease by a factor of 0.991, holding all factors constant. In percentages, the odds for females in the age group 20-60 are 1% less likely to participate than other age groups. It is concluded that the results are similar to the other studies [19-22].

Education: The effects of education reflects the choice between work and leisure and potential market earnings. The impact of education on the females' decision to go out for work is measured with different levels of education. The results show that education with five years of schooling has insignificant blow on females' decision to work in formal sector. The value of the coefficient of Edu1 is 0.217, which indicates that as female receives one more year of education; she is more likely to participate in the labor force and in formal sector by 0.217. The odds ratio of Edu1 is $1.243 > 1$, which represents that by taking all factors constant, the female is more likely to participate in formal sector by the factor of 1.243. It is also concluded that odds for females with education of five years of schooling to participate in formal sector are 24% higher than females with other education levels.

The education level up to ten years of schooling has a significant influence on the females' participation in economic activity. The coefficient of Edu2 has positive relation with FLFP in formal sector, as 0.358 represents that as females get one more year of education up to matriculation, more likely to participate in formal sector. The odds ratio of Edu2 is $1.430 > 1$, which shows that females' participation in formal sector is likely to increase with the factor of 1.430 if she has secondary education as compared to the education of five years schooling. Moreover, it shows that odds for female to participate in formal sector with ten years of education are 43% higher than a female with five years of schooling.

The higher education level up to sixteen years of education has an insignificant negative effect on females' labor force participation in formal sector. So, as females one year education increases up to sixteen years, females' participation in formal sector decreases by 0.248 units. The E(B) is presenting the odds ratio for female to participate in formal sector with sixteen years of education as compare to five years of education. The odds for the predictor is $0.781 < 1$ and this interpret that females with sixteen years of education are less likely to participate in formal sector as compared to females with five years of education and the percentage of odds for educated females (16 years education) fall by 21.9% than less educated females (5 years education).

The females' education with technical, professional or M.Phil/PhD degree has positive and significant on females' labor participation in formal sector. The value of estimate represents that females' participation in formal sector increases by 1.766 times with one unit increase in females' professional education. The odds of professionally educated females are 5.850, that is greater than 1 and indicate that females with professional degree are more likely to participate in formal sector than female with less education (5 years). Moreover, the odds of females to participate in formal sector with a professional degree are 485% more than the education level of five years schooling.

So, it is concluded that education of females turn out to be very important and vital factor in determining the labor force participation decision in formal sector. The literature also supports the hypothesis that females' participation in economic activity is positively correlated with education [17, 20-22].

Marital Status: The estimated value of the predictor, married female, is positive and insignificant. The females' participation in formal sector increases by 0.215 times with unit increase of married women. The marital status is not significantly influencing the females' decision to work outside in formal sector. The odds ratio of the predictor is 1.239 and that is greater than 1 and shows that married females are more likely to participate in labor force and in formal sector by a factor of 0.239 than an unmarried female. The odds for married females to participate in formal sector are 23% higher than unmarried females.

The results are also similar to the studies [14, 22]. While some studies have found the negative relationship between the married females and their participation in economic activity [16, 21].

Size of the Household: The variable describes the impact of household size on the participation of females' in formal sector of labor force positively. The size of the household has insignificant impact on females' decision to participate for work in formal sector. The coefficient of the variable is 0.035 and shows the positive influence on females' participation in formal sector. The odds ratio for the size of the household are greater than 1 and shows that with one unit increase in the household size, the females' participation in formal sector rises by 3.6%. It is found that other studies have estimated the same relationship between the females' participation in labor force and the size of the household [17, 20]. and the results are not parallel to the studies of [21, 22].

Number of Boys in the Household: The variable has the negative impact on the decision of female to participate in formal sector. The estimated value of parameter is -0.020 that shows with one unit increase in the number of boys in the family, female will less likely to participate by the factor of 0.02. This negative impact may be due to boys as independent workers in the family and the presence of more working people in the family reduce the females participation decision in labor force. These results are analogous with the finding of [20]. The presence of an additional boy in the family will decrease the probability of females participation by 2% as the odds ratio for the variable is $0.980 > 1$.

Number of Girls in the Household: Females participation in labor force and hence in formal sector is positively influenced by the presence of girls (≤ 10 years) in the household. The increased number of girls in the household has less opportunity for work and more consumption expenditures due to being in marriage- age group and the presence of dowry system in the society. Moreover, the presence of girls at home is the substitute to perform female domestic responsibilities as cooking, washing and child-care, so the females can easily decide to work outside. Hence females are more likely to participate with the presence of an additional girl in the household as the odds ratio show 1.029 that is greater than 1 and the probability of females' participation in formal sector increases by 2.9%. The literature also supports the results that females' participation in economic activity is positively correlated with the presence of girls [22].

Head of Household: The researcher has estimated the negative relationship between the female' decision to participate in the formal sector and the female as head of

the household. The results show that females are less likely to participate in formal sector by 0.039, as one unit increase in female's headship of the family. The odds ratio for the variable are 0.961 and it shows that the probability of female participation in formal sector decreased by 3.9% with one unit increase in the female as a head of the household. On the other hand many studies have found that females are more likely to participate in economic activity as head of the household [21, 22].

Income of the Family: To measure the impact of the household income, the per capita income of the household has been taken.. The impact of this variable has insignificant affect on the variable with no change. The inclusion or exclusion of this variable has not changed the females' participation decision in formal sector. However, the odds ratio of this predictor has shown neutrality in the probability of the females' participation in formal sector.

Household Type: The coefficient of the variable is positive and insignificant. The results show that females' belong to nuclear family are more likely to participate in the formal sector. The one unit increase in the female from nuclear family will affect the probability of females' participation by 21.9%. The reason may be that females belonging to small have less restrictions from the family members or the domestic responsibilities for these females are less as compared to the females from joint families. The results are found similar as [21], but some studies have found that females are more likely to participate if they belong to joint family [17, 20, 22].

Household Locality: The variable has insignificant positive blow on the females' decision to participate in the formal sector. It is found that females living in urban areas are more likely to participate in labor force. The probability of females' participation in formal sector rises by 1.4% because of one unit increase in female belongs to urban area.

CONCLUSIONS

The paper has identified and analyzed the major determinants of females participation in formal sector. For this purpose, data on women (aged 20-60), from *PSLM Survey (2007-2008)*, has been analyzed using the Binomial Logit model. The empirical results of the study suggests that for women higher education attainments lead to greater participation in formal sector. The results elucidate that there is greater probability of female labor force

participation with education at primary and matriculation level and the females are more likely to participate if they are married and belong to nuclear family living in urban area. Moreover, the results reveal that females participation increases with the increase in the family size and number of girls in the household. On the other hand, females' participation in formal sector decreases if female's education level is MA/MSc, the greater number of boys in family and if female is the head of the household.

From the study, it has been analyzed that education plays a imperative role in female labor force participation and our data explains that 72.9 percent females are illiterate, so there is need of the government role to improve the females educational status, so that they can participate in labor force and hence in the economic development of the country.

Limitations: There are few limitations of the study. The foremost of these is the study has not covered the aspects of opportunity cost of working women. This study focused on the limited factors (Age, education, household size, marital status, family status) of female participation in the formal labor force. Thus the other aspects like, the most relevant skills required for female participation, opportunity cost of working women, social cost of working women and health cost of working women can be considered and studied further.

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