

Economic Growth as it relates to Women's Labor Force Participation in the LAC

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Abstract:

This paper investigates the dependence of economic growth in the LAC and the relationship between Women's Labor Force Participation and growth in production and total GDP. This study is the incorporation of information and data from the LAC into a Solow Growth Model to examine the influence of participation on the GDP per capita of the region. Increases in GDP per capita are modeled by using the differences in current GDP per capita against the GDP after women's participation is increase to the same level to men's. The results show that if women were to actively participate in the labor force that the GDP per capita of the entire region increases.

JEL Classification: J21, J24, J82

Keywords: Women, Growth, Solow Model, LAC, and Equality

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1.0 INTRODUCTION

Labor force participation plays the largest role in determining the growth potential and measuring growth in the Solow model. What can be understood from growth and growth potential in smaller economies is that small policy changes can make a large impact on the amount of growth that can be realized. By addressing the largest factor in determining growth potential the possible increase in production is astronomical. It is within this context that the developing world can be viewed and better understood. Growth potential in this lens is also likened to the self-fulfilling prophecy wherein regions and countries that are deemed to have significant growth potential tend to attract the highest quality of investors but private and public alike and therefore have the resources to grow without as much hindrance.

This study aims to expand on the understanding of labor force participation and its eventual impact on developing nations. The idea of directing the study toward the LAC comes from a survey that concluded that very small amounts of women participate in the economy in South America. This is consistent with many of the cultural backgrounds of the countries of South America in which women are regarded as key homesteaders. These positions, while very important to the way of life in South America, do the economy no justice. This study in no way argues or aims to belittle these roles but rather is bringing attention to the economic growth potential that is being foregone in many of these countries.

Of the many reasons for the women to become more involved in the economies of this region, it would be unfair and irresponsible to not bring up the many reasons why women have not already become a more substantial part of the labor force. These reasons in no particular order are: taking care of the home, caring for the elderly, cooking for the family, as well as duties that arise from caring for children. While none of these activities are classified as women's work it is very typical in the LAC to find women contributing in this way. On top of these which are more likely to be within a women's choice in many cases men in these areas often steer women into these fields without giving them much of

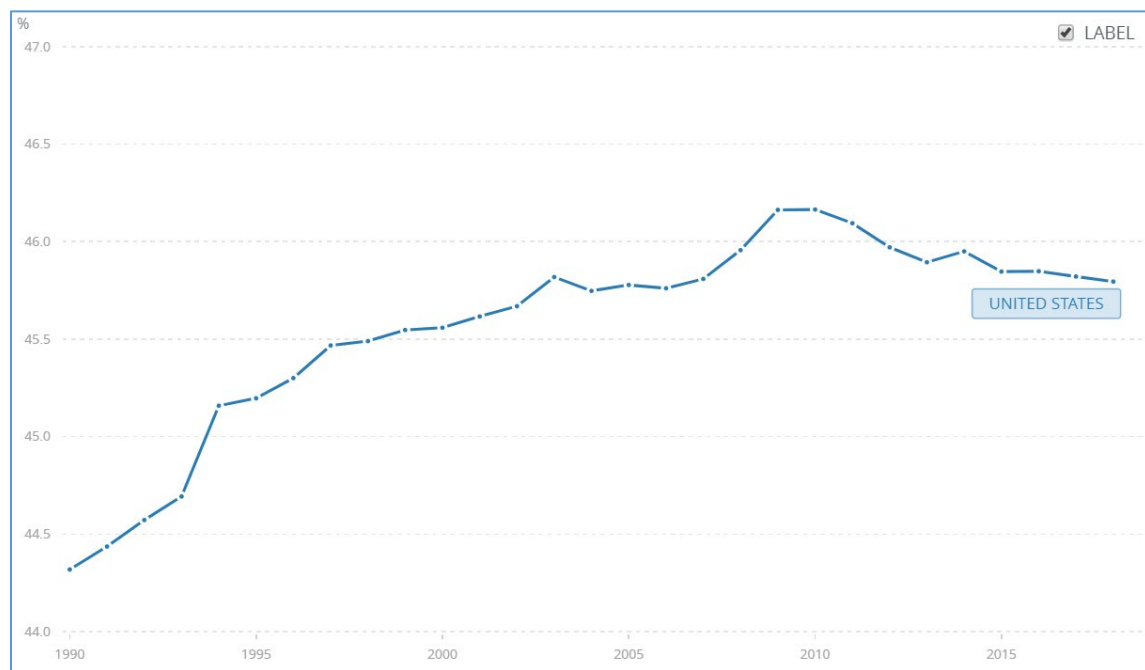
a choice. From a policy perspective, this analysis is important because the information in this study could be used to help shape policy into encouraging the inclusion of women in the workforce. This is an important step because with work not only will the economy grow with an enlarged labor force but the ability for women to earn money on a more national scale will help create financial freedom in many ways and has the potential to lead to steps toward greater equality and rights for women. The relevance of this study is that with each step that a country takes toward a more financially strong future is also a step for better living conditions, better chances for equality, and better chances for rights. These are contributing factors to happier better-off citizens.

This paper was guided by a series of research objectives that are more individually focused than other studies: First, it investigates the separation of women from the labor force using data from surveys that record the current occupational status of women from the LAC; Second, incorporating the data to produce a model of a working population that is still supportive of cultures and practices of region while intergrading a portion of the female population into workforce; Last using this data to compare to the growth patterns of similar countries that have already achieved success in terms of long term growth and commitment to a sustainable growth rate. While the work in this paper is theoretical, Empirical data, the model, and supporting papers bridge the gap to a more practical application of the findings.

2.0 Labor Force Trends of the LAC

Figure 1 shows the US breakdown between men and women in the workforce by the percentage of the workforce taken by women. In respect to the matter of women in the labor force in the LAC, the graph shows that on a developed scale that the breakdown is in favor of men in terms of employment. This graph is mostly to indicate how the gap between men and women in the workforce is even more apparent in the LAC. This is in part due to the lack of civil rights between men and women.

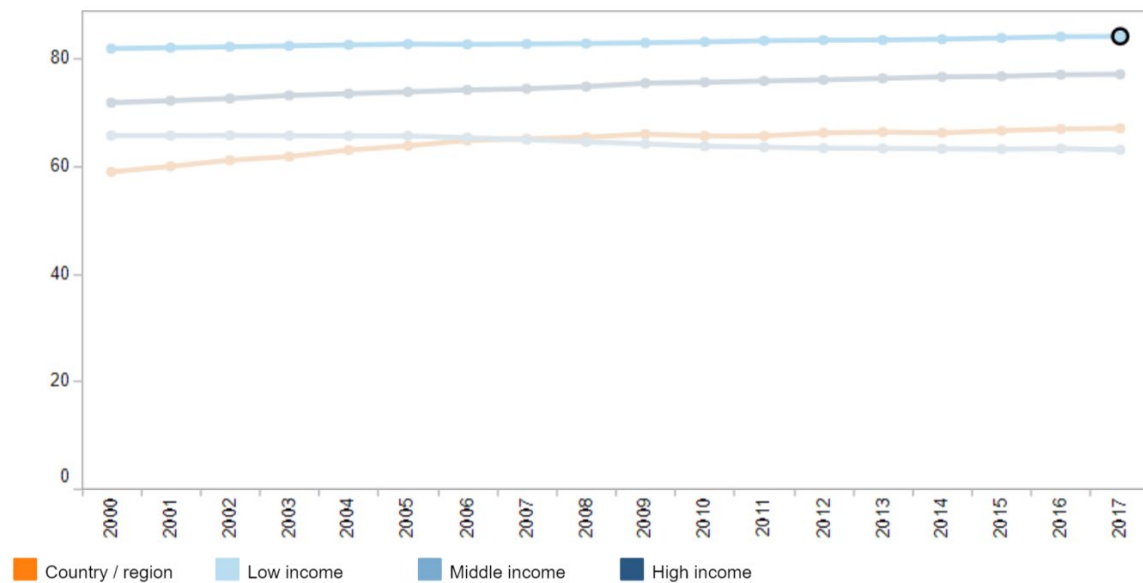
Figure 1: Labor Force, Female (% of Total Labor Force)



Source: World Bank Database

Figure 2 shows the ratio of female to male labor force participation rate in the LAC. This Graph indicates the disparity between men and women in the LAC region and breaks it down by income classification which demonstrates that the issue of disagreement in parity runs deeply through all aspects of society. Also apparent is the largest portion of society in the middle-income range has the lowest level of equality of the 3 groups.

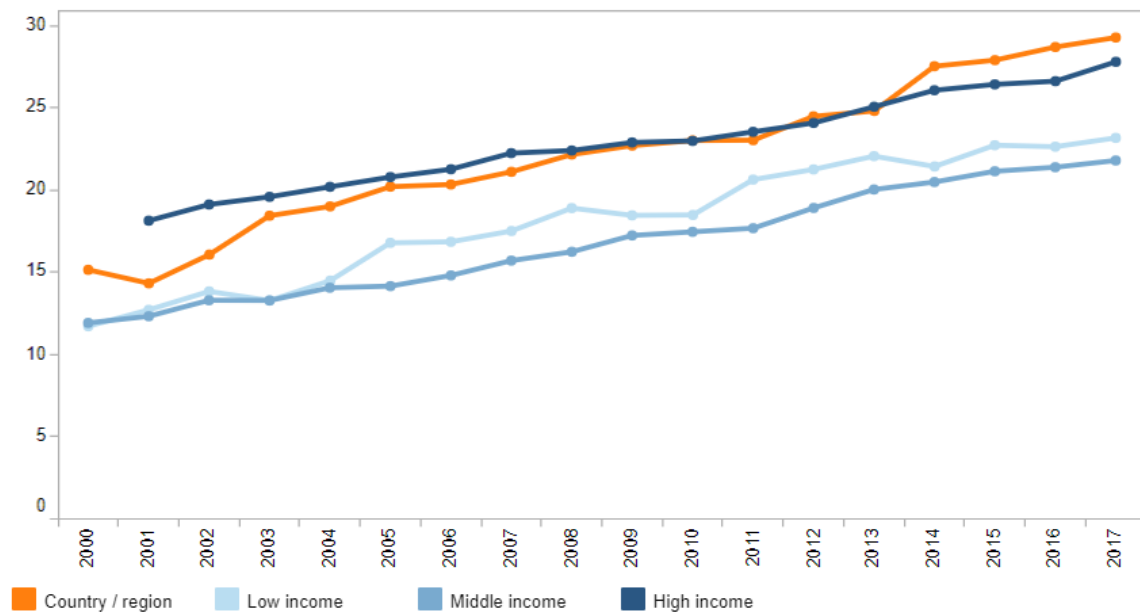
Figure 2: Ratio of Female to Male Labor Force Participation (%)



Source: World Bank Database

In the LAC region the issue of public life and decision making has a large effect on the policy that is put in place may that be economic or gender equality. The LAC has dismal participation from women in the government sector and as such often see fewer policies that are aimed directly at women's equality and because of this are failing to fully realize their economic growth potential. Figure 3 shows the breakdown of seats held in the national parliament by women.

Figure 3: Seats Held by Women in National Parliament (%)



Source: World Bank Database

3.0 Literature Review

The impact of women's labor market participation interacting with macroeconomic growth and family policy cannot be understated. The worldwide participation of women in the workforce continues to lag behind men. According to Luci, the global participation of women in the labor force is 54%. This number becomes even more unsettling due to the fact that the same metric puts male participation at over 80%. This disparity is even more prevalent in the poorer regions of the world where women's participation is significantly less than their male counterparts which are most apparent for mothers with young children. In Luci's Ph.D. thesis paper on the subject (of which a large portion of this study is based

on) she puts forth the idea that not only does this employment gap lead to less equality from a financial and societal perspective but it also leads to a largely untapped market of potential talent as well as a key player in increasing production in any given region.

For the perspective of women in the age of economic transformation, there have been a number of books and papers written on the subject. Heidi Nast's journal article on the subject supports the conclusions that were reached in this study. The international aspect of the cultural ramifications of trying to view the subject from an outside perspective should not be overlooked. The piece shows the cross-sectional reality of gender inequality on the sustainability of the labor force and to the previously mentioned economic transformations that result. The point is to look past the liberal attitudes on the subject and to dive into the overarching social themes that plague the issue to address how women in marginalized or developing nations react to the changes of their integration into the workforce

The focus on individual cases is invaluable in this study due to the way that every region has very specific attitudes and approaches to dealing with subjects as women's rights. Because of the varied backgrounds of the many regions that are investigated averages or general policy recommendations that are blanket recommendations are not only bad benchmarks but it would be irresponsible to use them. Madurawala, there is clear evidence that a system that is truly made to order so to speak supports a better end result. (Madurawala 2017) This study shows the opportunities that are currently available to women in Sri Lanka and that effect on the overarching economy. Then it incorporates the percent change that a restructuring of the opportunities that are available would pervade and measure the precise magnitude of the possible change.

Another area of wealth and opportunity that is currently being overlooked is that of innovation that is untapped in societies that do not take full advantage of the women in it. This is in reference to the entrepreneurial output is significantly undercut because of the exclusion of women in the labor force. According to Deborah Streeter, the disservice of not including women in the workforce becomes a measurable aspect. The forgone

opportunity of an expanded labor force can lead to technology lag in a country and region which ultimately holds countries back from reaching their growth potential. This lag also generates a gap between developed and developing nations because of the technological separation which can also feed migrations out of a country.

Another aspect that adds validity to the argument for the inclusion for women is that of the increase of human capital. This increase in human capital comes from the key development strategy that is currently only targeted at men in the LAC region. The increased investment of education is a proven way to increase the human capital of an area. This is an applicable issue for women because data suggests an increase in education for women in the LAC will cause the human capital of the region to be increased in future generations which will lead to equality which then leads to increased macroeconomic growth. According to Foster, while the impact of schooling in developing nations has been driven almost entirely in the results of men, the impact of women's education will have a similar if not more respectable impact on increased human capital.

Of the impact of women on the labor force and the intensity of employment, there is likely to be a discrepancy between men and women. Bret Anderson's article on the topic has yielded substantial evidence to support that women are undervalued in terms of production in the growth models. He argues that because of the differences of the treatment and positioning of women in the labor force that there will undoubtedly be a separation of employer benefits that accompany growth as well as a disproportionate amount of opportunities in the form of monetary as well as advancement. This uneven distribution has skewed the impact of women on the workforce into a negligible amount. His model illustrates that the impact of skewed data can be accounted for in many cases.

4.0 DATA AND EMPIRICAL METHODOLOGY

4.1 Data

This study uses quarterly time series data from 2003 to 2017. The data was obtained from the Center of Distributive, Labor and Social Studies (CEDLAS) which is a research

center that specializes in the empirical study of distributive, labor and social issues in Latin America. The branch of the CEDLAS that was utilized is the Labor Database for Latin America and the Caribbean (LABLAC). This section presents labor statistics for 13 Latin American countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Paraguay, Peru, and Uruguay. Summary Statistics for the data are provided in Table 1.

Table 1: Summary Statistics

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Min</i>	<i>Max</i>
<i>FLaborForc~n</i>	500	62.36858	7.445466	45.29129	78.01864
<i>MLaborForc~n</i>	500	91.7983	2.951675	84.07504	96.57318
<i>Funemployment</i>	500	6.103121	2.573658	1.051969	3.13862
<i>MUnemploy~t</i>	500	4.359254	1.439504	.7565686	11.06512
<i>FertilityR~e</i>	500	2.2616	.2081636	2.1	2.6
<i>Primarycom~e</i>	500	99.2852	.7555678	98.2	100.4
<i>GDPPPPinte~l</i>	500	7.87e+12	2.07e+12	4.58e+12	1.02e+13
<i>GDPPPPPerC~a</i>	500	13087.35	2716.147	8719.7	15801.8
<i>logGDPPPP</i>	500	29.65136	.3061322	29.15193	29.9513

4.2 Empirical Methodology

Following the Luci female labor force participation method this model focuses on the impact of a much smaller region of the world in order to best estimate the factors that are holding back women in the LAC.

$$\begin{aligned}
GDPperCapita_{it} &= \beta_1 + \beta_2 \ln GDP_{it} + \beta_3 FERT_{it} + \beta_4 EDU_{it} \\
&+ \beta_5 FUnemployment_{it} + \beta_6 MUnemployment_{it} + \beta_7 FLFP_{it} \\
&+ \beta_8 MLFP_{it} + \varepsilon_{it}
\end{aligned}$$

GDPPerCapita is the Gross Domestic Product of the LAC nations on a per capita basis. This metric best exemplifies the actual living income of the region as a whole.

MaleLaborForceParticipation and *FemaleLaborForceParticipation_{it}* is the participation score of women that are contributing to the labor mark in the LAC. This measure is the culmination of the current participation levels as well as the underlying reasons for the lack of performance in the sector. The intention of this model is to point to the lack of GDP growth as a function labor force participation and how this the lack of inclusion for women has caused the growth potential to invariably diminish. Because the Solow model uses labor force participation as a portion of the growth equation by dialing down this integral factor there can be more forward and direct improvements made to the LAC's economy and growth trend.

lnGDP_{it} is a logarithmic base form of historic GDP in the LAC which is used to correct for variations of in the GDP caused by things such as inflation or policies that are government sponsored that change the overall inflation rates.

FERT_{it} is the fertility rate in the LAC region. This variable has been included because as women are going to be giving birth this cuts into time that they can feasibly be participation in the workforce so by factoring in the fertility the variable can be determined to be a significant factor in low participation.

EDU_{it} is the educational attainment level for women in the LAC. This variable is included to offer up a determinant for women's participation in the workforce and is used to show the link between educational attainment and success in the labor market.

$FUnemployment$ and $MUnemployment_{it}$ show the level of unemployment in the labor market. These women are not included in the labor market and therefore need to be accounted for by giving an explanation for the lack of participation.

5.0 Empirical Results

The correlation of variables is presented below in table 2.

Table 2: Correlation

	<i>Years</i>	<i>FLabo</i> <i>r~n</i>	<i>MLabo</i> <i>r~n</i>	<i>FUne</i> <i>mp~t</i>	<i>MUne</i> <i>mp~t</i>	<i>Fertil~</i> <i>e</i>	<i>Primar</i> <i>~e</i>	<i>GDPP</i> <i>PP~l</i>	<i>GDPP</i> <i>PP~a</i>	<i>logGD</i> <i>P~l</i>
<i>Years</i>	1.0000									
<i>FLabor</i> <i>~n</i>	0.1421	1.0000								
<i>MLabo</i> <i>r~n</i>	-.0221	0.2440	1.0000							
<i>FUnem</i> <i>p~t</i>	-.1547	0.2440	-.0664	1.0000						
<i>MUne</i> <i>mp~t</i>	-.1728	0.0015	-.1877	0.7146	1.0000					
<i>Fertil~</i> <i>e</i>	-.8697	-.1684	0.0015	0.1339	0.1314	1.0000				
<i>Primar</i> <i>~e</i>	0.5033	0.1712	0.0032	-.1445	-0.1940	-.7605	1.0000			
<i>GDPPP</i> <i>P~l</i>	0.9347	0.1696	-.0071	-.1340	-0.1385	-.9723	0.7158	1.0000		
<i>GDPPP</i> <i>P~a</i>	0.9180	0.1741	-.0040	-.1346	-0.1431	-.9766	0.7459	0.9986	1.0000	
<i>logGD</i> <i>P~l</i>	0.9087	0.1742	-.0000	-.1282	-0.1340	-.9802	0.7435	0.9966	0.9986	1.0000

As is apparent in the above table there is a very strong relationship among female labor force participation, fertility, and primary education. It is this correlation that suggests that the statistical significance of female labor force participation is enveloped in fertility and primary education completion which are both significant at the 1% level.

The regression results are presented in table 3 below. The empirical estimation suggests a statistically insignificant relationship between female labor force participation and GDP per Capita. The overall results demonstrate a downward trend as a whole for the model.

Table 3: Regression

<i>GDPPerCapita</i>	<i>Coef</i>	<i>Std.Err.</i>	<i>t</i>	<i>P> t </i>	<i>[95% Conf.Interval]</i>	
<i>logGDPPPPI~l</i>	9361.933	102.4507	91.38	0.000	9160.638	9563.228
<i>FertilityR~e</i>	881.6117	155.3629	5.67	0.000	576.3551	1186.868
<i>Primarycom~e</i>	37.6531	12.80148	2.94	0.003	12.50078	62.80542
<i>FLaborForc~n</i>	.9383433	1.085022	0.86	0.388	-1.193506	3.070192
<i>MLaborForc~n</i>	-5.887159	2.217764	-2.65	0.008	-10.24461	-1.529703
<i>FUnemployment</i>	-2.856039	4.293779	-0.67	0.506	-11.29244	5.580367
<i>MUnemploy~t</i>	-14.77542	6.954461	-2.12	0.034	-28.43952	-1.111313
<i>_cons</i>	-269675.2	3670.162	-73.48	0.000	-276886.3	-262464.1

Of the estimated variables there are several significant variables. In terms of variables that are specific to men in the region both labor force participation and unemployment are significant with the former being significant at the 1% level and the later at the 5% level.

6.0 Discussion

As for keeping with the findings of that papers that have come before this study once again confirms the results that growth in female labor force participation has a positive relationship with GDP per capita growth within the scope of fertility and primary education completion rates of women. As of the completion of this study, there has been almost no consideration of women's rights in the LAC based on economic growth projections and modeling. This is the result of the fight being focused on receiving rights based solely on principle. I believe in this cause and as a supported, I believe it is prudent to use empirical studies such as the this to bolster the argument for more equality. This increase in rights, as well as the implementation of new social norms, will promote a compounding effect of women having the confidence to join the workforce with the fear of backlash or ridicule. Guiding this effort is the idea that data-driven results can inform important policy in the realm of equal opportunity. Policies that speak to access to education in both basic and higher levels for women will have a significant effect on the growth of this region. One major move would be a scholarship/grant program that can offset the cost of continued education for women. This sort of policy change not only brings more women into the higher education sphere in terms of access but also creates an incentive for women to compete for these grants and scholarships by increasing test scores and striving for academic achievement. Another area that lacks in the area of rights surrounding work for women is that of maternity leave. This is drawn directly on the finding that fertility as a whole is a positive indicator for growth and by allowing for women to temporarily leave the workforce without penalty there is a greater chance of successful women that did not have to give up on careers just to pursue a family.

This study does not escape without limitations. Throughout the research, there have been roadblocks in the form of a lack of complete data. This is common in many empirical studies of developing nations as the systems that need to be in place to capture this data are mostly too new, incomplete, or in some case non-existent. This creates a scenario where some variables that would have been used to better estimate the findings are not currently available. While the model provided is sufficient to paint a picture of the problem areas

there are parts of the model that do not escape a level on incompleteness. One such inconsistency is the data required to model the difference in pay between men and women. Because of the disparity, the amount that women contribute to the GDP per capita when compared to male contributions is incomparable. This sort of variable could lead to the conclusion that a more important area of policy focus could be in generating parity among wages but without the data, it is not currently possible to draw this conclusion with 100% certainty.

7.0 Conclusion

In summary, this study found that the significance of female labor force participation in the LAC region has no effect on GDP per capita. This, however, is accounted for by the effects of Primary education completion and fertility which are both highly correlated as well as statistically significant. The results of this paper imply that labor force participation is a significant predictor of GDP per Capita. To align with the findings of the study there are a few practical applications of the findings. In terms of policy changes that can capitalize on the findings federal programs that encourage women to complete their educations such as scholarships and grants for women that obtain degrees. Another suggestion would be the implementation of paid leave rights for women facing childbirth that expect to return to the workforce as well as having incentives for companies to enact equal opportunity hiring to balance the workforce.

Appendix A: Variable Description and Data Source

<i>Abbreviation</i>	<i>Description</i>	<i>Source</i>
<i>GDPperCapita</i>	GDP divided among the citizens on a nation	World Bank
<i>LnGDP</i>	Log of GDP PPP	World Bank
<i>FERT</i>	Fertility Rate	World Bank CEDLAS
<i>EDU</i>	Primary education completion rates in women	World Bank CEDLAS
<i>FLaborforceParticipation</i>	Women actively Involved in the labor force	CEDLAS
<i>MLaborforceParticipation</i>	Men actively involved in the labor force	CEDLAS
<i>FUnemployment</i>	Women that are unemployed	CEDLAS
<i>MUnemployment</i>	Men that are unemployed	CEDLAS

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