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The territorial dimension of female entrepreneurship towards *Europe 2020*

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Sommario: *Nell'ambito delle sfide lanciate da Europe2020, Strategia di crescita promossa dalla Commissione Europea nel 2010, il lavoro si pone l'obiettivo di analizzare i fattori che influenzano la scelta di diventare imprenditori, nel tentativo di far emergere un contesto omogeneo a livello europeo. In particolare, partendo da un dataset GEM (Global Entrepreneurship Monitor) e usando un modello di regressione lineare semplice, si vuole valutare l'incidenza di variabili demografiche, economiche e percettive sulla probabilità di diventare imprenditori. I dati, raccolti nel 2005, si riferiscono a diciassette paesi europei. Inoltre, in riferimento alla strategia di crescita per il prossimo decennio e a quanto contenuto nell'agenda per nuove competenze e nuovi posti di lavoro, nonché ai dati sull'occupazione femminile in Europa, si stimerà l'esistenza di un eventuale divario di genere.*

Abstract: *Within the challenges of Europe2020, the Growth Strategy promoted by the European Commission on March 2010, the paper will analyze the most important factors which influence the choice of becoming entrepreneur. The aim is trying to bring out the existence of a homogeneous European context. In particular, moving from a GEM dataset, the use of a logistic regression model allows to predict the probability to start a business after having considered demographic, socio-economic and perceptual independent variables. The data, relative to seventeen European countries, were collected during 2005. Finally, in reference to the growth strategy for the next decade and to the data on female employment rate, the existence of an eventual gender gap will be estimated.*

1. The GEM Dataset

The objective of this work is to find out the common determinants of entrepreneurial activity across seventeen European countries, with a special focus on female entrepreneurship. Several variables have been investigated, describing individual, environmental, psychological and sociological characteristics of people.

Data used for the empirical analysis are from the Global Entrepreneurship Monitor (GEM) project. Using population samples, the GEM project estimates in each country the prevalence rates of nascent and new businesses across several countries, through a survey of at least 2000 people within its adult population.

2. Empirical analysis

Since we are interested in describing the relationship between a dichotomous response variable Y (probability of becoming entrepreneur) which can take one of two possible values representing success or failure, and a set of k explanatory variables $X = (x_1, x_2, ..., x_k)$, the model used is the binominal logistic regression model.

3. The logistic regression model

For a binary response variable Y and an explanatory variable X, let $\pi(x) = P(Y = 1 | X = x) = 1 - P(Y = 0 | X = x)$, the logistic regression model is:

$$\pi(x) = P(Y=1 | X=x) = \frac{\exp(\alpha + \beta x)}{1 + \exp(\alpha + \beta x)}. \quad (1)$$

The right hand side of the equation (1) is always bounded between 0 and 1. However, model a variable which has restricted range, such as probability, is usually difficult. Therefore a transformation from probability to odds is necessary. The *odds* of some event happening (*e.g.* the event that $Y = 1$) is defined as the ratio of the probability that the event will occur divided by the probability that the event will not occur:

$$\text{Odds} = \frac{\pi}{1-\pi} \quad (2)$$

Then *odds* are transformed into *log odds*. This is an attempt to get around the restricted range problem in that it maps probability ranging between 0 and 1 to log odds ranging from negative infinity to positive infinity. It is also one of the easiest transformation to interpret. It is called logit transformation on the probability $\varpi(x)$ and has the following form:

$$\text{Logit } \pi(x) = \log\left(\frac{\pi(x)}{(1-\pi(x))}\right). \quad (3)$$

If the probability is 1/2 the odds are even and therefore the logit (3) is zero. Negative logits represent probabilities below one half and positive logits correspond to probabilities above one half.

Applying the transformation (3) to the logistic function (1) we get:

$$\pi(x) = \log\left(\frac{\pi(x)}{1-\pi(x)}\right) = \log\left(\frac{\frac{\exp(\alpha+\beta x)}{1+\exp(\alpha+\beta x)}}{1-\frac{\exp(\alpha+\beta x)}{1+\exp(\alpha+\beta x)}}\right) =$$

$$= \log\left[\frac{\exp(\alpha+\beta x)}{1+\exp(\alpha+\beta x)}\right]\left[1+\exp(\alpha+\beta x)\right] = \quad (4)$$

$$= \alpha + \beta x.$$

This model is now analogous to the linear model, except that the dependent variable is a log odds.

In equation (3) we were considering only a regressor x, adding more independent variables we obtain the *multiple logistic regression*:

$$\log\left(\frac{\pi(x)}{1-\pi(x)}\right) = \alpha + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k. \quad (5)$$

Interpreting coefficients

Both, in equation (1) and (5), β_k coefficients can be interpreted as the *log odds ratio* of the corresponding explanatory variable, when all the other explanatory variables are held constant. The *odds ratio* is defined as the ratio of the odds of one event to the odds of another event. In the logistic regression it is the ratio of the odds that Y = 1 given a particular value of an explanatory variable to the odds that Y = 1 given a different level of the same variable. It is defined as follow:

$$\text{OR} = \frac{\frac{\Pr(Y=1 \mid x)}{1-P(Y=\mid x)}}{\frac{\Pr(Y=1 \mid x')}{1-\Pr(Y=1 \mid x')}} \quad (6)$$

where x and are two different values of the explanatory variable. The odds ratio result is an index of association between the dependent and the independent variables: when OR>1, there is a positive association; when OR<1, there is a negative association; when OR = 1, there is no association.

The odds multiplier for x_k is indeed $e^{\beta k}$: when is x_k increased by one unit and all the other explanatory variables are held constant, the odds of success increases by a factor $e^{\beta k}$. For dummy coefficients, a unit difference in x_k is the difference between membership in category x_k and membership in the omitted category. In this case $e^{\beta k}$ is the odds ratio for those in the membership category versus those in the omitted category. The logistic regression therefore calculates changes in the log odds of the dependent, not changes in the dependent itself. When $\beta = 0$, Y is independent of X.

The intercept α parameter usually is not of particular interest. However, when $x = 0$, α becomes the logit at that mean.

Parameters estimation: maximum likelihood procedure

Estimates of the intercept α and the regression coefficients β_k are obtained using the maximum likelihood estimation procedure (MLE). This technique maximizes the value of the *log likelihood function*. Given the data, for a chosen probability distribution, the *likelihood function* (7) indicates how likely it is to obtain the observed values of Y, given the values of the independent variables and parameters $\alpha, \beta_1, \ldots, \beta_k$:

$$\begin{aligned} L^{\theta}(x_1, x_2, \ldots, x_n) &= f_{\theta}(x_1, x_2, \ldots, x_n) = \\ &= f_{\theta}(x_1) \ldots\ldots f_{\theta}(x_n). \end{aligned} \quad (7)$$

In (7) f is the density function, ϑ is the unknown parameter and $x = (x_1, x_2, \ldots, x_n)$ is the set of observations. The maximum likelihood estimate is therefore the parameter value that maximizes this function or, alternatively, the parameter value under which the data observed have the highest probability of occurrence.

MLE procedure

Suppose to have a sample of n individuals with n binary responses. When more than one observation occurs at a fixed value of the explanatory variable x_i, it is sufficient to record the number of observations n and the number of successes. Then we can let y_i refer to this success count rather than to an individual binary response. Therefore $\{Y_1, ..., Y_N\}$ are independent binomials with $E(y_i) = n_i\pi(x_i)$. Their joint probability mass function is proportional to the product of N binomial functions and equal to:

$$\prod_{i=1}^{N}\pi(x_i)^{y_i}\left[1-\pi(x_i)\right]^{n_i-y_i}$$

$$=\left\{\prod_{i=1}^{N}\exp\left[\log\left(\frac{\pi(x_i)}{1-\pi(x_i)}\right)^{y_i}\right]\right\}\left\{\prod_{i=1}^{N}\left[1-\pi(x_i)\right]^{n_i}\right\}$$

$$=\left\{\exp\left[\Sigma_i y_i \log\frac{\pi(x_i)}{1-\pi(x_i)}\right]\right\}\left\{\prod_{i=1}^{N}\left[1-\pi(x_i)\right]^{n_i}\right\}. \quad (8)$$

Writing the multiple logistic regression model (5) with α as regression parameter having unit coefficient:

$$\pi(x_i)=\frac{\exp(\sum_{j=1}^{p}\beta_j x_{ij})}{1+\exp(\sum_{j=1}^{p}\beta_j x_{ij})} \quad (9)$$

where $\sum_{J=1}^{p}\beta_j x_j$ is the i_{th} logit and recalling (3), it is evident that the exponential term in (7) equals:

$$\exp\left[\sum_i y_i\left(\sum_j \beta_j x_{ij}\right)\right]=\exp\left[\sum_j y_i\left(\sum_i y_i x_{ij}\right)\beta_j\right]. \quad (10)$$

Also, since $\left[1-\pi(x_i)\right]=\left[1+\exp\left(\sum_j \beta_j x_{ij}\right)\right]^{-1}$, the the log likelihood equals:

$$\text{L}(\beta)=\sum_j\left(\sum_i y_i x_{ij}\right)\beta_j-\sum_i n_i \log\left[1+\exp\left(\sum_j \beta_j x_{ij}\right)\right]. \quad (11)$$

The likelihood equations necessary to estimate our model parameters result from setting $\frac{\delta L(\beta)}{\delta(\beta_j)}=0$. Given that:

$$\frac{\delta L(\beta)}{\delta(\beta_j)}=\sum_i y_i x_{ij}-\sum_i n_i x_{ij}\frac{\exp(\sum_k \beta_k x_{ik})}{1+\exp(\sum_k \beta_k x_{ik})}, \quad (12)$$

the likelihood equations are:

$$\sum_i y_i x_{ij}-\sum_j n_i\hat{\pi}_i x_{ij}=0 \quad (13)$$

$\hat{\pi}_i=\exp\left(\sum_k \hat{\beta}_k x_{ik}\right)/\left[1+\exp\left(\sum_k \hat{\beta}_k x_{ik}\right)\right]$ is the maximum likelihood estimate of $\pi(x_i)$.

The equations are non linear and require an iterative procedure, which is implemented by a statistical software, to be solved.

Testing hypothesis: Wald test and likelihood ratio test

Once the coefficients of the independent variables are estimated through MLE method, it is necessary to evaluate the statistical significance of the contribution of their associated independent variables to the explanation of the dependent variable. For each coefficient estimated we test two hypothesis:

$$\begin{cases} H_1 : \beta \neq 0 \\ H_0 : \beta = 0 \end{cases}$$

H_1 assumes the significance of the independent variable setting the associated coefficient different from 0; H_0 assumes the non significance of the independent variable setting the associated coefficient equal to 0. Two standard ways exist to use the likelihood function to perform large-sample inference: Wald test and Likelihood ratio test.

4. Wald test

To test the significance of $\hat{\beta}$ MLE estimate with non null standard error (S.E), the Wald statistic is calculated as:

$$z=\frac{(\hat{\beta}-\beta_0)}{S.E}, \quad (14)$$

where β_0 is the coefficient value under the hypothesis of independence H_0.

(13) has an approximate Standard Normal distribution, therefore one refers z to the standard normal table to obtain one or two-sided p-values. Setting, for instance, the confidence level $\alpha = 0{,}05$, we reject H_0 if p-value $<0{,}05$ and we accept H_0 if p-value $>0{,}05$.

Equivalently, the Wald statistic may be calculated as:

$$z^2 = \left[\frac{(\hat{\beta} - \beta_0)}{S.E} \right]^2,$$

in which case it is asymptotically distributed as a X^2 distribution and one can make reference to X^2 distribution table.

5. Likelihood ratio test

The second method uses the likelihood function (7) through the ratio of the maximizations of two models, the first containing a set of parameters, the second containing all of the parameters from the first, plus one or more additional variables. Likelihood ratio test (LR) is therefore a comparison between the fit of two models, one of which is *nested* in the other. A model, *reduced,* is considered nested in another, *full*, if the first model can be generated by imposing restrictions on the parameters of the second.

The LR test uses twice the difference between the maximized log likelihood of the two models (reduced and full) and verifies whether this difference is statistically significant. Let L_0 denote the maximized value of the likelihood function under the reduced model and L_1 denote the maximized value under the full model, the likelihood ratio test is calculated as follow:

$$-2 \log \Lambda = -2 \log(\ell_0 / \ell_1) = -2(L_0 - L_1) \quad (15)$$

This statistic is distributed Chi-squared with degrees of freedom equal to the difference in the number of variables between the two models (i.e., the number of variables added to the reduced model).

After comparing the log likelihoods of the two models, the likelihood ratio test verifies whether their difference is statistically significant. If the difference is statistically significant, let say at 5% level of confidence ($\alpha = 0{,}05$), then the less restrictive model (the one with more variables) is said to fit the data significantly better than the more restrictive model and the null hypothesis can be rejected. However, if the reduced model explains the data almost as well as the full model, the difference between them will be close to 0 and the null hypothesis can be accepted, confirming the non significance of the independent variable x_i.

6. Results and discussion

There is a direct relation between the odds ratio and the logistic coefficient (β):

$$Odds\ Ratio = e^{\beta}.$$

Independent variables are categorical variables, representing economic and demographic factors: age, education, gender, income level and work status. They are classified as follow:

- gender*: male, female;*
- age: *18-24, 25-34, 35-44, 45-54, 55-64, 65-98;*
- income: *lower (inc_1), middle (inc_2), upper(inc_3), cannot code (inc_4);*
- education: *some secondary (educ_1), secondary (educ_2), post secondary (educ_3), graduate experience (educ_4), cannot code (educ_5);*
- work status: *full time (work_1), part time (work_2), retired (work_3), homemaker (work_4), student (work_5), not working (work_6), cannot code (work_7).*

To improve the fit of the model, some perceptual variables will be added. They are obtained by asking the respondents the following questions:

- opportunity perception: "*In the next six months there will be good opportunities for starting a business in the area were you live?"*
- knowledge of other entrepreneurs: *"You know someone personally who started a business in the past two years?"*
- confidence in one's skills: *"You have the knowledge, skill and experience required to start a new business?"*
- fear of failure: *"Fear of failure would prevent you to start a business?*

7. General overview

The decision to start a new business is a complex, multi-layered process, contingent to a large extent on the context in which the decision is taken. The aggregate level of entrepreneurial activity of a country, however, is crucially influenced also by its entrepreneurial capacity. And the entrepreneurial capacity of a country depends on its people. Age, gender, work status, education, income, and access to financing are all significant socioeconomic factors in a person's decision to start a business. Not by chance they are the explanatory variables of the current analysis.

The following table, using a multilevel approach, that permits the explanatory variables effects to vary across countries, offers the results for a more general examinattion.

The role of women has been recently recognized as one of the driving forces of the global economy of the 21st century. According to Europe 2020 Strategy, an inclusive growth must be pursued and the policy makers have the "mission" to enhance

Business start	Coefficient	Standard Error	Z	P > |Z|	[95% Confid. Interval]
Gender	-0.537	0.040	13.11	0.000	(-0.617,-0.457)
Age	-0.0002	0.0001	-12.37	0.000	(-0.0002,-0.0001)
Middle inc.	0.066	0.051	1.28	0.200	(-0.0349, 0.1671)
High inc.	0.213	0.054	3.94	0.000	(0.107, 0.32)
Cannot code	0.134	0.060	2.23	0.026	(0.016, 0.252)
Secondary education	-0.016	0.06	-0.28	0.782	(-0.133, 0.1007)
Post sec. education	0.233	0.065	3.55	0.000	(0.104, 0.362)
Graduate Experience	0.308	0.051	5.93	0.000	(0.206, 0.409)
Cannot code	0.512	0.186	2.74	0.006	(0.146, 0.877)
Part time	0.208	0.080	2.59	0.009	(0.051, 0.366)
Retired	-1.112	0.113	-9.82	0.000	(-1.335, -0.890)
Homemaker	-0.678	0.103	-6.53	0.000	(-0.881, -0.474)
Student	-1.146	0.106	-10.76	0.000	(-1.355,-0.937)
Not working	-0.068	0.081	-0.84	0.400	(-0.227, 0.090)
Cannot code	-0.042	0.13	-0.33	0.744	(-0.3, 0.213)
Intercept	-1.67	0.159	-10.50	0.000	(-1.983, -1.36)

this. However, a gender gap is still apparent. Moreover, the odds ratio 0,58 suggests that in general, women have almost three out of five the possibility of men to start a business. The reasons of this gap are essentially: poor business environment, the choice of business types and sectors, information gaps, lack of contacts and access to networking, gender discrimination and stereotypes, weak and inflexible supply of childcare facilities, difficulties in reconciling business and family obligations or differences in the way women and men approach entrepreneurship, financial constraints. Women tend to seek small personal loans to start small firms. Nonetheless, there is a common belief that females lack of financial competencies.

Specific actions or measures promoting female entrepreneurship have already been established in almost all Member States of the European Union to offer support for start-ups, funding, training, mentoring, information, advice and consultancy, networking.

The age coefficient implies that increasing the age, the probability to set up an independent activity decreases.

While secondary education is not significant, post secondary education allows people to have = 1,26 the possibility of those having only some secondary education the chance to start a business. However, graduate experience is the most significant category: people owning such an education are = 1,32 times more likely to success than those having only some secondary education.

8. Regression with perceptual variables

What already done with the simple logistic regression can be implemented by adding four perceptual variables: opportunity perception, knowledge of other entrepreneurs, confidence in one's skills, fear of failure. They describe perceptions and beliefs of individuals that cannot refer to objective situations and they are supposed to improve the fit of the model. Let look how the model changes adding the new variables:

Gender and age are substantially unchanged, income is no more significant, the impact of post secondary education and of graduate experience is now negative and non significant, indicating an interaction with one of the added variables. The main finding is that the perceptual variables are powerful predictors of the likelihood of being a nascent entrepreneur, they are all highly significant. In particular, knowing other entrepreneurs is positively and significantly related to being a nascent entrepreneur. The positive impact of opportunity perception is coherent with the economic theory according to which alertness to unexploited oppor-

Business start	Coefficient	Standard Error	Z	P>lZl	[95% Confid. Interval]
Demographic and economic variables					
Gender	-0.217	0.047	-4.61	0.000	(-0.31, -0.125)
Age	-0.0002	.0000198	-10.61	0.000	(0.0002, -0.0001)
Middle income	0.0018	0.059	0.03	0.975	(-0.113, 0.117)
High income	-0.084	0.061	-1.36	0.174	(-0.205, 0.037248)
Cannot code	0.029	0.07	0.41	0.680	(-0.108, 0.166)
Secondary education	-0.153	0.068	-2.23	0.026	(-0.287, -0.0184)
Post secondary Education	-0.061	0.075	-0.82	0.415	(-0.21, 0.086)
Graduate Experience	0.044	0.059	0.75	0.453	(-0.072, 0.161)
Cannot code	0.514	0.221	2.32	0.020	(0.079, 0.95)
Part time	0.313	0.091	3.41	0.001	(0.133, 0.493)
Retired	-0.642	0.123	-5.21	0.000	(-0.88, -0.4)
Homemaker	-0.273	.1211751	-2.26	0.024	(-0.51, -0.035)
Student	-0.775	0.122	-6.31	0.000	(-1.016, -0.534)
Not working	0.141	0.094	1.49	0.137	(-0.044, 0.327)
Cannot code	0.124	0.161	0.77	0.439	(-0.191, 0.44)
Perceptual variables					
OpportunityPerception	0.571	0.045	12.59	0.000	(0.482, 0.66)
Know other Entrepreneurs	0.554	0.046	11.89	0.000	(0.463, 0.645)
Skills	1.378	0.06	23.12	0.000	(1.262, 1.5)
Fear of failure	-0.34	0.0506	-6.71	0.000	(-0.438, -0.24)
Intercept	-2.79	0.17	-16.41	0.000	(-3.132, -2.46)

tunities is the necessary condition to undertake an economic business. The odds ratio of confidence in one's skill is = 4,15, suggesting that those who perceive themselves as possessing capacities are 4,15 times more likely than those who do not feel the same way, to be nascent entrepreneurs.

9. Adding interaction terms

A step further in the analysis, useful to evaluate the existence of an eventual gender gap is verify whether gender variable changes the relationship between the dependent and the independent variables. Therefore, some terms of interaction are added to the current logistic regression. Seventeen new variables are generated multiplying the gender variable by each category of each independent variable.

The new outcome overall suggests that the relation between the likelihood to become entrepreneur and the household income variables, the educational variables and the work status variables, do not depend on gender, given the non significance of their associated coefficients. Two over four perceptual variables interacting with gender are instead significant: women are more able than men to exploit and recognize opportunities and they are more confident in their own skills. However, a woman able to perceive opportunities is = 0,64 times as likely as her male counterpart to become entrepreneur. Therefore, although women are less likely than men to become entrepreneurs, the positive interaction between gender and the ability to recognize an opportunity suggests that the role of opportunities with respect to the choice to be entrepreneur is different between women and men, having more importance in the former case. In the case of women with confidence in their own skills, = 0,73 implies that women have almost two thirds the possibilities of men to become entrepreneurs. Therefore gender is not neutral in its relation with opportunities perception and confidence in one' abilities. Only knowing other entrepreneurs and fear of failure variables confirm the importance of perceptual variables as drivers of entrepreneurial behaviour for both men and women, without any gender bias.

Business start	Coeff.	Standard Error	Z	P>|Z|	[95% Confid. Interval]
Demographic and Economic variables					
Gender	-0.7	0.527	1.33	0.184	(-1.734, 0.332)
Age	-0.0002	0.00002	-10.52	0.000	(-0.0002, 0.0001)
Middle income	-0.0533	0.177	-0.30	0.765	(-0.4020, 0.2954)
High income	0.0270	0.185	0.15	0.884	(-0.336, 0.39)
Cannot code	0.197	0.2124	0.93	0.353	(-0.2189, 0.614)
Secondary Education	0.09	0.184	0.49	0.625	(-0.271, 0.451)
Post secondary education	-0.337	0.212	-1.59	0.113	(-0.753, 0.08)
Graduate experience	0.186	0.171	1.09	0.277	(-0.149, 0.523)
Cannot code	0.695	0.659	1.06	0.291	(-0.5955, 1.985)
Part time	1.019	0.324	3.14	0.002	(0.383, 1.653)
Retired	-0.134	0.354	-0.38	0.704	(-0.8285, 0 .56)
Homemaker	0.72	0.708	1.02	0.310	(0.6685, 2.107)
Student	-0.82	0.36	-0.51	0.610	(-0.884, 0.5192)
Not working	0.631	0.281	2.25	0.025	(0.08, 1.182)
Cannot code	-0.052	0.495	-0.11	0.916	(-1.022, 0.918)
Perceptual variables					
Opportunity Perception	0.211	0.134	1.58	0.114	(-0.0508, 0.475)
Know other Entrepreneurs	0.54	0.1395	3.87	0.000	(0.2657, 0.812)
Skills	0.809	0.18	4.50	0.000	(0.457, 1.162)
Fear of failure	-0.475	0.153	-3.10	0.002	(-0.776, -0.175)
Interaction variables					
*Gender*low income*	1 .118	0.14	0.84	0.401	(-0.157, 0.395)
Gender middle income*	0.16	0.138	1.16	0.247	(-0.1109, 0.4308)
*Gender*High income*	0.041	0.143	0.29	0.770	(-0.238, 0.321)
*Gender*some second. Education*	0.1430	0.467	0.31	0.758	(-0.773, 1.061)
*Gender*secondary education*	-0.03	0.47	-0.06	0.951	(-0.951, 0.893)
*Gender*post second. Education*	0.346	0.476	0.73	0.467	(-0.587, 0.28)
*Gender*graduate Experience*	0.035	0.46	0.08	0.940	(-0.885, 0.956)
*Gender*full time*	-0.104	0.314	-0.33	0.739	(-0.720, 0 .511)
*Gender*part time*	-0.538	0.357	-1.51	0.132	(-1.237, 0.161)
*Gender*retired*	-0.51	0.4	-1.25	0.211	(-1.271, 0.28)
*Gender*homemaker*	-0.654	0.48	-1.36	0.173	(-1.6, 0.287)
*Gender*student*	-0.561	0.398	-1.41	0.158	(-1.34, 0.217)
*Gender*not working*	-0.464	0.36	-1.30	0.195	(-1.167, 0.238)
*Gender*opportunity*	0.262	0.09	2.89	0.004	(0.0842, 0.4398)
*Gender*know entrepreneurs*	0.0106	0.093	0.11	0.909	(-0.171, 0.193)
*Gender*skill*	0.388	0.119	3.26	0.001	(0.154, 0.621)
*Gender*fear of failure*	0.097	0.101	0.96	0.337	(-0.101, 0.297)
Intercept	-2.317	0.272	-8.51	0.000	(-2.850, -1.783)

10. "Women are now the most powerful engine of global growth"

The empowerment of women is a " revolution" begun almost 50 years ago, when female entrance in the labour market had a remarkable consequence: women could finally control their economic fate, being independent from men. This implied a relevant social change, affecting the family and therefore the society structure. One of the responsible for this "revolution" was the technological progress which reduced the amount of time needed for the traditional work of cleaning and cooking. But probably the most significant innovation was the contraceptive pill: it increased their incentive to invest time and effort in acquiring skills. The expansion of higher education has increased the job perspectives for women, gradually shifting their role from stay at home mothers to successful professional persons. But women's rising aspirations, due to their increased educational background, remained unsatisfied: the most "powerful" working positions were dominated by men. Recent data confirm this trend, showing not only that women are less paid than men, but overall that they are induced to choose between motherhood and careers. This is a burden for society, a cost due to its incapacity to deal with changes, a renounce to grow using an enormous and available human capital: the women. According to a Goldman Sachs analyst, the higher female employment rate already increased the Eurozone GDP by 0,4% per year. Therefore, countries such as Italy and Japan, where the female participation rate is very low, involving women in the labour market would have a stronger increase in terms of GDP. The shift from a "humanitarian" consideration to a more economic one, able to predict the economic loss in terms of efficiency, could be a premise to reshape the role of women in the economy.

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