RESEARCH ARTICLE

Gender Gap in Entrepreneurship: Evidence from Argentina

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Abstract: We investigate which factors affect the gender gap in entrepreneurship using evidence from CBMS Argentina and the Oaxaca-Blinder decomposition for nonlinear models. The dataset allows us to construct a series of personality variables (risk aversion, social aversion, outgoing attitude, flexibility desire, and effort aversion) which are usually missing in standard household surveys. In addition, we can measure current entrepreneurial activity as well as failure from the past. We find that there is no evidence of discrimination in the event of starting up, since the small gap between women and men can be fully explained once the new personality variables are taken into account. There is, however, a higher rate of failure for women that cannot be explained with the observed individual characteristics. As a consequence, it is a gender gap in attrition and not at the event of starting up what explains the current gap in entrepreneurship.

Keywords: entrepreneurship, gender, personality, Argentina, Oaxaca-Blinder

JEL Classification: J16, J23, L26

Entrepreneurship has an important role in economic development and it has been largely studied, at least since Schumpeter (1934) proposition. However, we are still far from completely understanding what drives people into entrepreneurship (Giannetti & Simonov, 2004).

There are psychological factors such as entrepreneurial attitudes (creativity, proactivity, and risk tolerance) and sociocultural factors such as the entrepreneurship role models and the businessmen perception, which might be difficult to quantify but important for the development of entrepreneurs. Giannetti and Simonov (2004) grouped the determinants of entrepreneurial activity in: personal characteristics (including, for instance, wage, assets, marital status, education, risk attitude, age, and gender), characteristics of the economic environment (regulations, taxes, laws, labor demand, etc.) and characteristics of the social environment (stock of knowledge available, others' business experience, social norms, or status attributed to particular occupations).

Among those personal characteristics, there is a particular interest in the role of women on entrepreneurship. Especially after the seminal paper of Schwartz (1976), that pointed out the need to understand better the role of women on entrepreneurship, this branch of the literature has grown significantly, as the

recent surveys by Henry, Foss, and Ahl (2015) and Yadav and Unni (2016) showed.

The international evidence (Kelley, Singer, & Herrington, 2012) showed that there are fewer women involved in entrepreneurial activities than men, although this gap is very heterogeneous across countries. The evidence also reveals that there is a tendency for this gender gap to narrow (Singer, Amorós, & Moska Arreola, 2014).

Siri, Kelley, Kew, Herrington, and Vorderwülbecke (2012) showed that not only there are fewer female entrepreneurs than male in nearly every economy, but female entrepreneurs also appear to show more reluctance to scale up their businesses or to enter into new and less tested markets. In addition, women tend to be more often motivated by necessity than opportunity to start up, have less confidence in perceptions of their capabilities to start a venture; and have a higher fear of failure.

Henry et al. (2015) made a comprehensive literature review on gender and entrepreneurship research for the last 30 years, pointing that one problem in the research has been the lack of appropriate data. Often the studies rely on household surveys that are not particularly designed to study entrepreneurship, and neither have gender-disaggregated data. In another literature review, Yadav and Unni (2016) showed that studies on gender gap in entrepreneurship are mostly restricted to developed economies, so there is a need to understand better gender gap in developing countries.

Latin America is an interesting region to study because it has the lowest gap between women and men in entrepreneurial intent (those willing to start up a business), although, according to Singer et al. (2014), the gap increases when we look at entrepreneurship event. However, there is little information as to what could explain this gap in the region and provide evidence to support policy designs to address gender gap in entrepreneurship. Is it due to personal attributes (age, gender, education, etc.), personality characteristics (i.e. risk aversion), wealth, family background? How the gender gap evolves from the intent to the event and then to the success of the venture?

Due to the lack of rich microeconomic data in Latin America, gender gap in entrepreneurship has not been deeply studied. One exception is Bernat, Lambardi, and Palacios (2017) who studied gender gap and its decomposition in the region, using three different definitions of entrepreneur. Depending on the definition of entrepreneur used, the overall gender gap varies from 4% to 13% points. Differences in observable characteristics explain between 23% and 38% of the total gender gap. The factors that explain both entrepreneurial activity and gender gap are: education, risk tolerance, own car as primary means of transportation, work satisfaction, and parent business ownership. Variables such as age, access to loans, and need for achievement are significantly associated with entrepreneurial activity, but they play a negligible role in explaining the gender gap.

The results of Bernat et al. (2017) are in line with Caliendo, Fossen, Kritikos, and Wetter (2015), who investigated gender gap in entrepreneurship using a German household survey. Doing a decomposition analysis, they also found evidence that the gender difference is not just difference on a personality characteristic (risk aversion), but there is also an educational effect contributing to the gap, as working women in Germany are less educated than men (and, therefore, less inclined to start a business). But in Latin America, the educational gender gap has reversed and it has moved in favor of females (Duryea, Galiani, Ñopo, & Piras, 2007), and their labor market participation has increased significantly as well. The labor market and the level of human capital might also help to explain entrepreneurial activity (Georgellis & Wall, 2005) and gender gap.

Also, there is interest in the youth propensity towards an entrepreneurial activity as a professional career (often called entrepreneurship intent). This interest is justified by the evidence that entrepreneurship might be fostered or restricted by the early life experience. Schoon and Duckworth (2012), for instance, analyzing the 1970 British Birth Cohort Longitudinal Data from birth to age 34, found that being entrepreneur was associated with social skills and entrepreneurial intentions expressed at age 16.

In this paper, we aim to contribute to the understanding of the gender gap in entrepreneurship, particularly among the youth, by analyzing the case of Argentina with a new dataset that allows us to link the entrepreneurs with their family background and with failed ventures. We want to know as to what extent the gender gap is explained by observed characteristics (such as age, education, exposure to entrepreneurship, or personality characteristics). Our paper is related to Caliendo et al. (2015) and Bernat et al. (2017), who also decomposed the gender gap for current entrepreneurs

(those who have a venture) as we do. One innovation of our paper is that we analyze the gap at the moment of starting up (the event), thus avoiding the attrition bias. We therefore can provide evidence whether the observed gap in current entrepreneurs against women is already present at the moment of starting up or it is created later because of a higher failure rate.

The Argentine Community Based Monitoring System (CBMS) survey was administrated to young individuals (between 15 and 26 years old) living in small cities of the province of Buenos Aires. As the questionnaire was especially designed to study entrepreneurship, we have individual characteristics that usually are missing in standard household survey. As Caliendo et al. (2015), we are able to explore how personality characteristics and the differences between men and women affect the entrepreneurial activity. Personality characteristics play an important role as there is evidence that there are gender differences in the fear of failure (Wagner, 2007), risk attitudes (Caliendo, Fossen, & Kritikos, 2009), self-confidence (Koellinger, Minniti, & Schade, 2013), or the willingness to compete (Bönte & Piegeler, 2013). In addition, in developing countries there might be other type of gender differences related to the different role that women and men play in the household production. With our database, we are able to test whether these differences are responsible for the gap in Argentina.

Econometrically, we followed the decomposition approach of Bauer and Sinning (2008) for nonlinear models. The variable we want to analyze is a dummy indicating whether the person is an entrepreneur or not. The decomposition approach is simple: estimate two independent Probit models for males and females, and then try to decompose the difference in the probability of becoming an entrepreneur in two different factors: (i) the explained component ("explained" by group differences in the value of the regressors that motivate entrepreneurship, such as education and experience), and (ii) the unexplained component (residual part that cannot be accounted for by such differences in entrepreneurship determinants). This "unexplained" part is often used as a measure for discrimination, but it also subsumes the effects of group differences in unobserved predictors. We would expect that as missing variables (such as the personality variables) are included, the unexplained gap is reduced.

Understanding what drives the gap is important for policy prescriptions. If the gap is explained by difference in education, for instance, a policy prescription to democratize entrepreneurial opportunities would be to eliminate the gender gap in education. If the gap is explained by personality variables, the policy prescription is obviously different. Personality might be more difficult to be affected by policies, and we would need to understand first how these personality characteristics were formed. Finally, if after including a large set of controls we find that the unexplained gap is large, we might suspect that gender discrimination might be a problem, and a different set of policy prescriptions might emerge.

We make the distinction between current entrepreneurs (the survivors) and failed entrepreneurs (those who started up a venture but later decided to quit), and explore the gender gap in both (the event and the success).

Our findings show that the gender gap in (current) entrepreneurs is significantly reduced once the new personality variables are included, but the gap is not eliminated completely, implying that females are still facing more restrictions than males. But when we go to the event (starting up), we find a much smaller gender gap, which can be fully explained by the personality variables. Once we take into account that women are less likely to start up due to their personality characteristics, there is no gender gap—both have equal access.[1] The main difference is in the survival rate. Females are much more likely to quit the new venture. There is an important gap in the survival rate favoring males. Most of this gap is unexplained by our controls. Personality variables do not help to close the gap in survival, and among our controls only exposure to entrepreneurship (having a member of the family who is also an entrepreneur) helps to close the gap.

These results have important policy implications. Democratization of entrepreneurship requires paying more attention to the early stages of the new venture, where women face more obstacles than men. Equal opportunities in education, training, and financial access are not enough to close the gender gap in entrepreneurship.

The rest of the paper continues in the following way. The next section presents background research for entrepreneurship in Argentina. We then describe our empirical model and the variables we use, analyze the results, and present the final conclusions.

Entrepreneurship in Argentina

There is a small economic literature studying entrepreneurship in Argentina based on standard household surveys, focused on measuring entrepreneurship, and trying to understand what motivates the event. To the best of our knowledge, gender gap in entrepreneurship has not been analyzed yet.

Argentina differs from other countries of Latin America by the influence of European immigration originally, and immigration from other Latin American countries recently. It was for many decades the most developed country in the region, with the best educational indicators, a large participation of the women on the labor force, and a large middle income class.[2] Income mobility has been important too. All these conditions look like a good environment for individuals seeking opportunities in entrepreneurship. Nevertheless, according to the GEM, compared with other countries in the Latin American region, Argentina has generally ranked in the middle, with most of its entrepreneurial activity and attitudes rates being close

to the regional average. According to GEM, the typical Argentinean entrepreneur is generally male, between 25 and 44 years of age, and with an upper level of education. Most start-ups are in retail, agriculture, and professional services. Almost 2/3 of entrepreneurs are motivated by opportunity, with the remaining 1/3 motivated by necessity. This proportion varies depending on which stage of Argentina's economic cycle is measured. As expected, opportunity-driven entrepreneurship (those starting a business to pursue an opportunity, rather than because they have no other option for work) grows in stable economic conditions, whereas necessity rate increases during crisis. In particular, entrepreneurship increased sharply after the large crisis that Argentina suffered in 2001/2002. Between 2001 and 2013, the nascent entrepreneurship (businesses under three months old) rate of start-ups grew by almost 40%, whereas the rate of "new business owners" (between 3 and 42 months old) has more than doubled. In the same period, the participation of women in entrepreneurship has more than doubled too.

Gluzmann et al. (2012) also found the entrepreneurship rate in Argentina is close to the
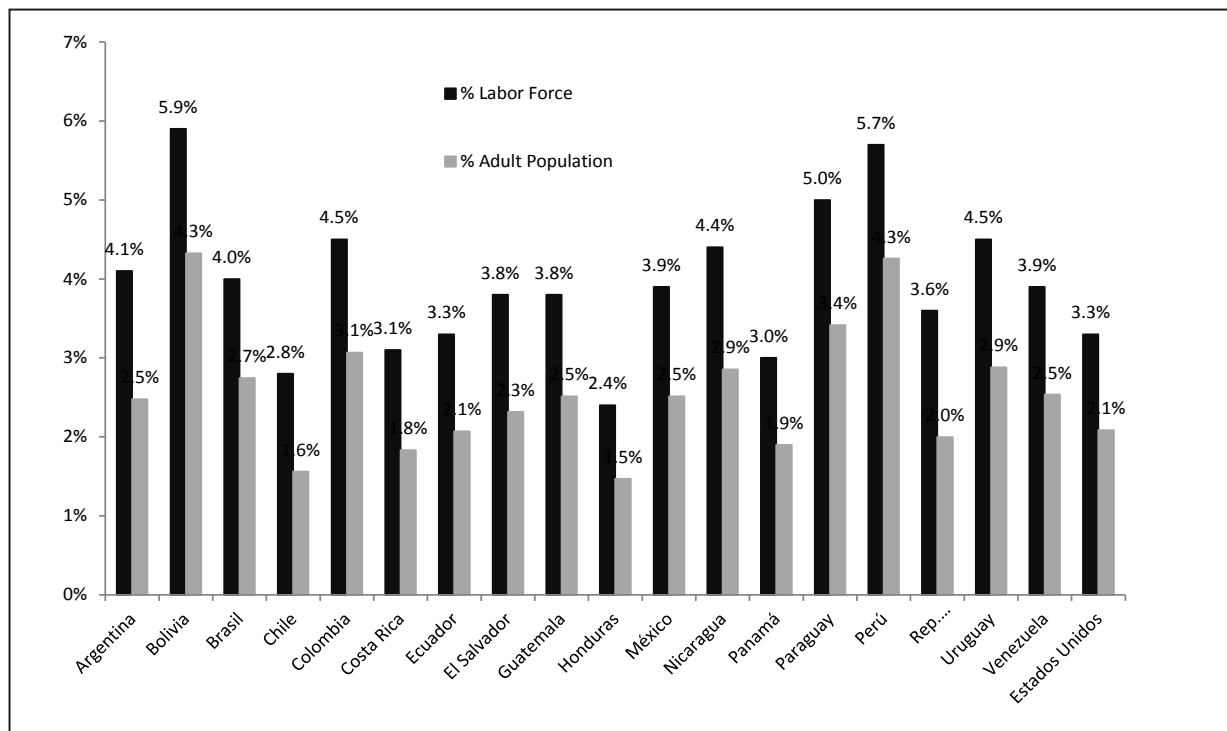
Source: Gluzmann, Jaume, and Gasparini (2012)

Figure 1. Importance of entrepreneurs in the labor market.

average of Latin America. This study uses national household surveys to estimate the entrepreneurship rate,[3] but this definition does not distinguish between self-employed and a real entrepreneur. Entrepreneurs represent 4.1% of the labor force (or 2.5% of the total adult population) in Argentina, which is close to the Latin American average, a region with high level of entrepreneurship (compared to the U.S.), but with a very different quality of entrepreneurship. The average age of an entrepreneur in Argentina is 47 years old, the oldest of all the working categories, in line with other countries and the U.S. (50 years old).

According to Ardagna and Lusardi (2008), Argentina has many entrepreneurs (it compares well internationally) but there are many "necessity" entrepreneurs and not so many "opportunity" entrepreneurs.

A good description of entrepreneurship in Argentina is the study of Anchorena and Ronconi (2012), who used a special module about entrepreneurship included in the Argentine household survey EPH (Encuesta Permanente de Hogares). This study found that although the quantity of entrepreneurship is high in Argentina, its quality is low, given the high proportion of informal and necessity entrepreneurs. Nearly one-fourth of the employed population over 14 years of age are independent workers (22.7%), of which 4.5% are employers (employer–entrepreneurs), 4.7% are self-employed and work with at least one more person (self-employed entrepreneurs), and 13.5% are the "pure"

self-employed. Entrepreneurs (employer-entrepreneurs and self-employed entrepreneurs) represent 9.2% of the employed population. Most of employer-entrepreneurs are male, with small business (median size is four workers),[4] older than the typical worker, and with more years of schooling.

A large share of this become entrepreneurs out of necessity rather than opportunity. Within employer-entrepreneurs (or entrepreneur 1), 22.5% are so by necessity, while within self-employed entrepreneurs (or entrepreneur 2), 45.5% are so by necessity.

Anchorena and Ronconi (2012) showed that income plays a greater role in determining probability of becoming an entrepreneur than parental wealth. People born in higher-income families are more likely to become entrepreneurs, and people from lower-income families are more likely to end up working as either employees or as self-employed, but the differences are small. Entrepreneurship is, however, transmitted intergenerationally. People whose parents owned a business were more likely to become entrepreneurs, this is a strong relationship (the probability of becoming an entrepreneur is 15.8 percentage points higher if your parents owned a business, while it is only between 1.5 and 6.3 percentage points higher if your parents were high income, relative to middle class, and low income). Parental occupation is thus a better predictor of entrepreneurship compared to parental wealth, but parental wealth is an important determinant of the
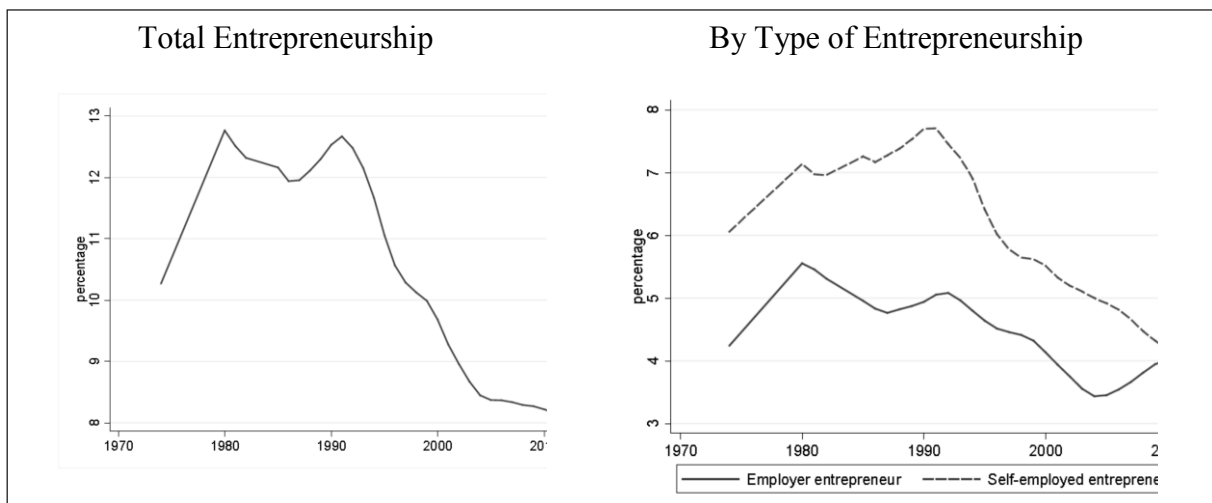
Source: Anchorena and Ronconi (2012)

Figure 2. Evolution of entrepreneurship (as a share of economic activity population) 1974–2011, EPH.

skills of entrepreneurs (entrepreneurs from lower-income families have on average between three and four years less schooling compared to entrepreneurs from higher-income families).

An interesting result of Anchorena and Ronconi (2012) emerged when they compared entrepreneurship propensity across cities, finding public employment at city level crowded out entrepreneurship, particularly those who are somewhere in the middle of the "quality" spectrum—since they find public employment has no effect on the quality of entrepreneurship.

Kantis, Federico, and Trajtenberg (2012)[5] studied entrepreneurship in Argentina, Brazil, Peru, Ecuador, and El Salvador on household surveys, based on the employed-entrepreneur definition. They found that men are predominant in all occupational categories, but their predominance is even greater among entrepreneurs. Most entrepreneurs, or employers, tend to be over 40 years old. Moreover, entrepreneurs tend to be older than employees and slightly older than the self-employed.[6] Women and young people were found to have the lowest entrepreneurial propensity. Entrepreneurs tend to be more educated than workers, except in Peru. However, educational levels are not homogeneous across countries. In Argentina, around 30% of entrepreneurs have a university degree, while in Brazil, less than 4% of entrepreneurs have university degrees. In terms of social composition, the middle class makes up an important and increasing part of the entrepreneurial population. This is especially true in Argentina and Brazil, where the middle class represents more than 60% of the entrepreneurial population. University graduates show the highest propensity in most of the countries studied and econometric results of career choice show that university education is one of the main determinants of the choice between paid employment and business ownership in Argentina.

Mandelman and Montes Rojas (2007), using a panel constructed with Argentine household survey EPH, studied to what extent self-employment is a first step to start up a profitable business in Argentina. They found that the self-employed are relatively young, with lower salaries that employees, and lower qualifications. The transition is not necessary from a young self-employed to a mature entrepreneur, as many persist for years as self-employed without workers. Self-employed and entrepreneurs have different characteristics and react differently to the business cycle. According to

these authors, the evidence supports the existence of experienced and talented individuals who were able to accumulate enough capital and managerial abilities to start their own business projects and generate employment; although this is a limited phenomenon. Two-thirds of the self-employed are actually own-account workers, and if they manage to survive, they will most likely remain within this category. Their findings pointed out to a segmented market. Those with extraordinary entrepreneurial abilities (pure entrepreneurs), or the remarkably low-qualified individuals with little chance to find employment in the job market (misfits) may choose to be self-employed on a permanent basis. Other workers may face serious difficulties finding paid jobs during recessions and may regard self-employment as a safe refuge while searching for a proper salaried position.

Data and Methodological Approach

The Data

We are interested in studying the gender differences in the entrepreneurship rate for young individuals in small towns of Argentina, based on a unique dataset. Previous studies on entrepreneurship in Argentina have not explore gender gaps and have been based on standard household survey (EPH), which is not designed to study this topic and lacks the important variables related to the personality of the individual.

We use the most recent CBMS data collection. CBMS is a household census administrated in Argentina by the Universidad Nacional del Centro de la Provincia de Buenos Aires, and financed by PEP network (Partnership for Economic Policy). The census was first administrated in the city of Tandil in 2011, and then again in Olavarría and Tandil in 2014 and 2015.[7] The standard instrument used by CBMS is a household questionnaire of living conditions. In the second wave, in addition to the family questionnaire, young family members between 16 and 26 years old completed a special questionnaire on youth employment and entrepreneurship. This questionnaire includes several qualitative questions, in addition to the more standards quantitative questions. As it is linked to the household survey, we can also measure the family background.

The sample contains 1,999 young individuals, distributed evenly between men (1,002) and women (997). Of them, 116 individuals are business owners,

what gives a current entrepreneurship rate of 6%. In addition, 60 individuals have started up in the past but failed (failed entrepreneurs) and now they are unemployed (18), working (24) or studying (18), but they are not entrepreneurs anymore. Therefore, we have 176 individuals (8.8% of the sample) who have started up a business, but 60 quitted (a failure rate of 34%). Among the current entrepreneurs, 11% have failed at least once in the past.

Most of the ventures were motivated by opportunity and desire for independence. Only 23.7% started

up because they needed money (see Figure 3). The economic situation of these ventures looks solid, since only 2 out of 116 were generating losses. Most of the start-ups are in the service sector, followed by retail (see Figure 4).

Women are slightly more motivated to start up by need than men, but for both genders opportunity and desire for economic independence are the most important factors. Women are more likely to start up to gain working experience and to replace the absence of job opportunities than men, which
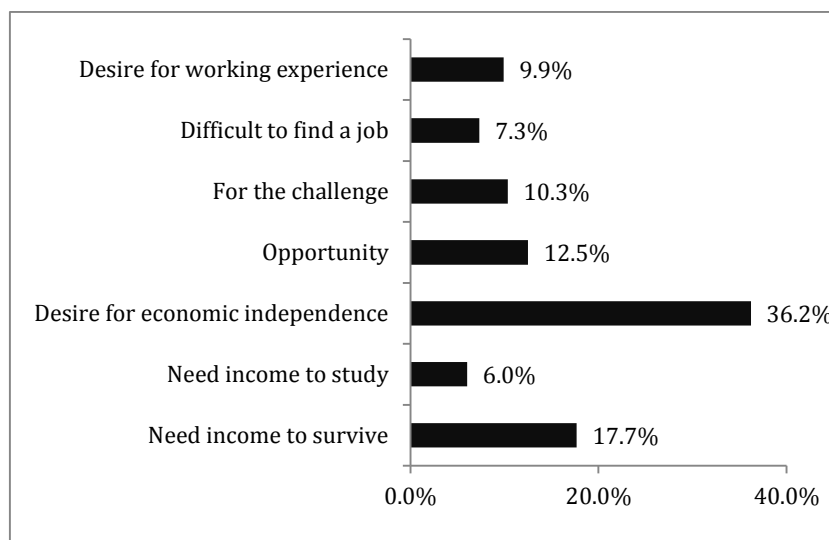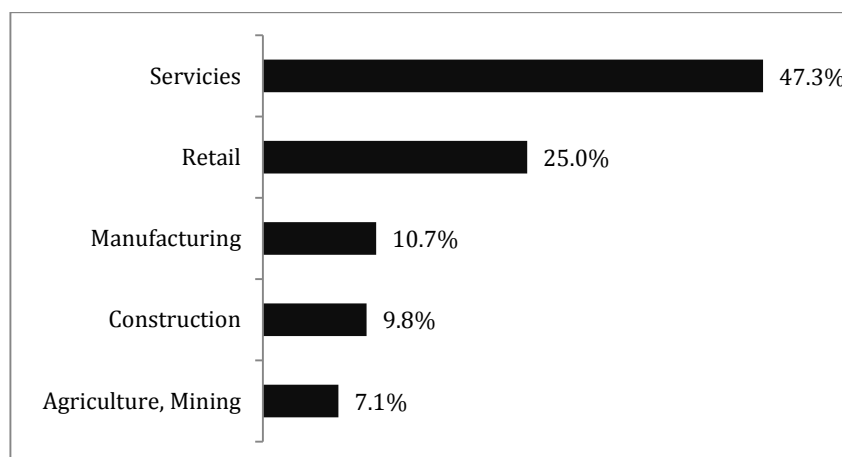

Figure 3. Start-up by motivation.

Figure 4. Ventures by economic sector.

Table 1. *Motivations to Start Up by Gender*

	Female	Male
1. Need income to survive	19.1%	16.7%
2. Need income to study	6.4%	5.8%
3. Desire for economic independence	37.2%	35.5%
4. Opportunity	10.6%	13.8%
5. For the challenge	6.4%	13.0%
6. Difficult to find a job	8.5%	6.5%
7. Desire for working experience	11.7%	8.7%
Total	100.0%	100.0%
Need (1+2+6)	34.0%	29.0%
Opportunity (3+4+5+7)	66.0%	71.0%

Note: This question was asked only to business owners.
Source: Own elaboration based on CBMS 2014/15, Argentina.

Table 2. Economic Sector of the Venture by Gender

	Female	Male
Agriculture, Mining	2.3%	11.3%
Construction	0.0%	19.4%
Manufacturing	7.0%	9.7%
Retail	37.2%	19.4%
Services	53.5%	40.3%
Total	100.0%	100.0%

Note: This question was asked only to business owners.
Source: Own elaboration based on CBMS 2014/15, Argentina.

what might indicate that women face more labor restrictions.

There are significant differences in the economic sector of the venture. Services is the most popular sector, even more for women than men (53.5% and 40.3% of the ventures are services). Agriculture, mining, and construction are mostly chosen by men.

Women show higher level of education (there is an educational gap in favor of women) both by years of education and by quality (lower repetition rate). Almost 25% of the young females are not working and neither studying, whereas this ratio is just 9.3% for males. Employment rate is 51.7% for males but only 23.9% for females.

Table 4 reports entrepreneurship rates by gender. Women are less interested in entrepreneurship than men (60.8% and 50.3%, respectively). More men (42.8%) than women (34.5%) do not have a business but would like to have on in the future (entrepreneurial intent); 4.7% of women and 6.9% of men have their own business, a gender gap of 2.18% against women. If we consider those who have ever started up a venture, the gap is lower: 8.1% of women have started up compared to 9.5% for males. Nevertheless, the failure rate of these start-ups is almost double for females (42% vs. 27.4%).

Of those who have started up and failed, 43% would like to start up again (still have the intention)

Table 3. *Individual Characteristics by Gender. CBMS 2015/2016*

	Female	Male	Total
Average Age (years)	19.81	20.09	19.96
% of sample less than 18 years old	31.9%	28.44%	30.17%
% working	23.9%	51.7%	37.86%
% studying	60.68%	51.9%	56.28%
% working & studying	9.45%	12.87%	11.17%
% NOT working & NOT studying	24.92%	9.28%	17.08%
Education			
Incomplete Primary	1.3%	1.2%	1.3%
Primary Complete	7.3%	11.7%	9.5%
Incomplete Secondary	10.8%	14.8%	12.8%
Studying in Secondary	40.5%	37.3%	38.9%
Secondary Complete	14.4%	15.0%	14.7%
Tertiary (1)	25.6%	20.1%	22.8%
School Repetition Rate (2)	33.1%	42.9%	37.6%

Notes: (1) Individuals with some education at tertiary or university level.
     (2) % of individuals that have repeated at least once.
Source: Own elaboration based on CBMS 2014/15, Argentina.

Table 4. *Entrepreneurship and Gender. CBMS Argentina*

	Cases			Rates		
	Total	Female	Male	Total	Female	Male
Not interested in entrepreneurship	1,110	606	504	55.5%	60.8%	50.3%
With Entrepreneurial Intent	773	344	429	38.7%	34.5%	42.8%
Current Entrepreneurs	116	47	69	5.8%	4.7%	6.9%
Total	1,999	997	1,002	100%	100%	100%
Current Entrepreneurs	116	47	69	5.8%	4.7%	6.9%
Failed Entrepreneurs	60	34	26	3.0%	3.4%	2.6%
Total Entrepreneurs (Failed + Current)	176	81	95	8.8%	8.1%	9.5%
Failed Entrepreneurs who still would like to be an entrepreneur	26	13	13			
Main Reason to give up the venture						
Not profitable	14	13	27	41.2%	50.0%	45.0%
Don´t like it	1	3	4	2.9%	11.5%	6.7%
Too demanding	4	0	4	11.8%	0.0%	6.7%
I switch to other activity	15	10	25	44.1%	38.5%	41.7%
Total	34	26	60	100.0%	100.0%	100.0%

Note: We define entrepreneurial intent based on the question 31, "If you could choose an ideal situation for you, which of these options would be?"[8]
Source: Own elaboration based on CBMS 2014/15, Argentina.

but again there are important gender differences: the rate is 50% for men but only 38% for women. This is related to the reason to stop the start-up. For men, the most important reasons were the lack of profitability or because they did not like it (57.6%), but for females the most important reason to give up the venture is related to switching to other activity.

The Econometric Model

The standard method to analyze the components of the gender gap is the decomposition approach proposed by Oaxaca (1973) and Blinder (1973). Gender gap is based on two linear regression models that are fitted separately for men and women and then the results are compared. The predicted gap between the two groups is decomposed into two components: one that is attributable to gender-specific observed differences in the various individual characteristics, also called endowment effect (or explained effect), which is the part of the differential caused by group differences in the average values of the predictors; and one that is related to unobservable factors, frequently interpreted as discrimination.

For a linear regression model, we have two independent equations for men and women:

$$Y_m = X_m \beta + e_m$$

$$Y_w = X_w \gamma + e_w \qquad (1)$$

The average difference between the two groups can be decomposed (just adding and subtracting $\bar{X}_w \beta$) as:

$$\bar{Y}_m - \bar{Y}_w = (\bar{X}_m - \bar{X}_w)\beta + \bar{X}_w(\beta - \gamma) \qquad (2)$$

The first term on the right-hand side of (2) displays the difference in the outcome variable between the two groups that is due to differences in observable characteristics (the explained effect or endowment effect), whereas the second term shows the part attributable to differences in coefficients (the unexplained effect) often associated with discrimination.

We are interested in explaining a binary variable (dummy taking 1 if the individual is an entrepreneur), and the problem is that for a nonlinear model the conditional expectations, E(Y|X), can differ from X*b. Equation 2 for the nonlinear case is:

$$\bar{Y}_m - \bar{Y}_w = \left[E_\beta(Y_m/X_m) - E_\beta(Y_w/X_w) \right] \qquad (3)$$
$$+ \left[E_\beta(Y_w/X_w) - E_\gamma(Y_w/X_w) \right] `$$

To compute the conditional expectations, we follow the approach of Bauer and Sinning (2008).[9]

In addition, Oaxaca and Ransom (1994) showed that the equation 2 of Oaxaca-Blinder is a special case of a more general decomposition where the unexplained part is further decomposed in the difference due to the advantage of one group and the disadvantage of another group (in each coefficient) against a benchmark. Starting from the system of equations in (1) we can add and subtract $(\bar{X}_m - \bar{X}_w)\beta^*$ and re-express the difference in the means as:

$$\bar{Y}_m - \bar{Y}_w = (\bar{X}_m - \bar{X}_w)\beta^* + \qquad (4)$$
$$\bar{X}_m(\beta - \beta^*) + \bar{X}_w(\beta^* - \gamma)$$

β^* are the coefficients under no discrimination. The first part is differences in endowments or productivities. The second part is the advantages of males, and the third part the disadvantages of females against the benchmark β^*. Further this benchmark might be defined as weighted average:

$$\beta^* = \Omega\beta + (I - \Omega)\gamma \qquad (5)$$

If Ω =I, equation (4) is reduced to equation (2). The original Oaxaca-Blinder decomposition expressed by equation (2) assumes one group, women in this case, is discriminated against other. Therefore, the unexplained part is just the disadvantages of females against males.

There are several alternatives for Ω. Cotton (1988) suggested a simple average ($\Omega = 0.5$). Reimers (1983) suggested weighting the coefficient vectors by the proportions of the observation in each group. Neumark (1988) proposed to obtain the benchmark from a pooled estimation.

We will use a value of I for omega (i.e. the original Oaxaca-Blinder approach), what implicitly assumes that there is no discrimination in males–or that discrimination occurs exclusively on females. Nevertheless, we also present the weighting scheme proposed by Cotton (1988) and Neumark (1988) as reference.

The dependent variable. First, we need to define who is an entrepreneur. As we are interested in young entrepreneurs in small towns, the narrow definition

based on entrepreneurs with workers (those who work independently and employ at least one additional person) is not appropriate. Besides, the current trend in the literature on entrepreneurship is to use a broader definition, which focuses on founders of start-ups and young ventures. By excluding the self-employed we might leave outside of our analysis informal microenterprises, which are a significant phenomenon in Latin America. Therefore, we define individuals as entrepreneur if they have (alone or in partnership) their own business. As the business is running, we call them current entrepreneurs.

Previous studies in Argentina have focused exclusively on current entrepreneurs, but if we want to understand the event (starting up a business) rather than the success, we should use a broader definition to avoid attritional bias. Keep in mind our database includes only young individuals (between 16 and 26 years) and it is perfectly possible that a failed entrepreneur can try again later. In addition, the high volatility of Argentina makes entrepreneurship volatile too. For these reasons, we will also do the analysis for a broader definition of entrepreneurship that includes current business owners and those who have started up in the past and failed.

The explanatory variables. The literature on entrepreneurship stressed the importance of including personality variables to explain the entrepreneurial event (Giannetti & Simonov, 2004; Bernat et al., 2017), in addition to the standard individual characteristics of labor economics such as age, experience, and education. Family background and entrepreneurial exposure are also important explanatory variables, as entrepreneurs (to be successful) need to have wide range of skills, and many of them are not trained at the school (Lazear, 2004).

Personality. Personality characteristics are usually missing in standard labor market surveys, which is a big shortcoming. Business owners as compared to other populations are higher in need for achievement, risk-propensity, innovativeness, and internal locus of control (Collins, Hanges, & Locke, 2004; Rauch & Frese, 2007; Stewart & Roth, 2004). The recent meta-analytic study of Brandstätter (2011) highlighted the significant associations between personality and entrepreneurship.

The standard approach to construct personality variables is to follow the Big Five personality traits—also known as the five-factor model (FFM). The individual makes descriptions based on questions, and these descriptors are grouped together using factor analysis (see Goldberg, 1993). The five factors have been defined as openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism, often listed under the acronyms OCEAN.

Personality not only plays an important role in the event of starting up a new business, but also in the success. Personality characteristics such as enduring personality, consistency of interests (or passion), and

Table 5. *Personality Characteristic Dimensions Included in CBMS 2015/2016*

14.01	Being my own boss
14.02	Having flexibility with hours / holiday
14.03	Having the opportunities of earning more incomes
14.04	Doing what I like
14.05	Create jobs
14.06	Not having a steady income every month
14.07	Having to cope with business risks
14.08	Having to work more than 9 hours a day
14.09	Having to be proactive (i.e. own initiative)
14.10	Having people whose work and income depends on me.
14.11	Learn about activities of a business or organization
14.12	Having to manage multiple activities of a company or organization.
14.13	Having to go out and sell products or services
14.14	Having to negotiate with others

perseverance of effort are related to venture success (Mooradian, Matzler, Uzelac, & Bauer, 2016) as well as opportunity recognition, opportunity exploitation, innovation, and value creation (Ahmetoglu, Leutner, & Chamorro-Premuzic, 2011; Shane & Venkataraman, 2000).

Following this literature, we construct personality characteristics using factor analysis. As described in Auguste and Bricker (2016), we used CBMS question 14, which asks the individuals how positive or negative they feel about 14 statements (Likert scale with five categories). For instance, question 14.01 asks how positive or negative he/she feels about being his/her own boss, and the possible answers were 1. Very positive, 2. Positive, 3. Indistinct, 4. Negative, and 5. Very negative. Table 5 summarizes the 14 statements included in CBMS Argentina.

Next, we run factor analysis using the 14 answers to identify the factors and their weights (see Auguste & Bricker, 2016). We identified five factors (weighting differently each of the 14 statements, see Table 6) and based on these factors we constructed five index variables. To simplify the analysis, for each factor we choose those variables that were the most important to explain the factor variance. To construct each variable, we re-run factor analysis only

on the selected factors for each variable (and forcing in each case to create one factor). This gives us the final factor weight of each statement to construct each variable.

In the factor that we call Risk Aversion, only two variables explain 80% of the load and both are related to risk (what gives the name to the factor): (i) Not having a steady income every month and (ii) Having to cope with business risks. We should expect that the higher the risk aversion the less likely to become an entrepreneur (Knight, 1921/2012; Kihlstrom & Laffont, 1979). Also, we should expect a gender differences as there is evidence that females show more fear of failure (Wagner, 2007) and more risk aversion (Caliendo et al., 2009).[10]

The second factor is what we call Social Aversion and it weights two statements related with having to interact socially (to sell or to negotiate). The higher this index, the more social avert is the individual and we would expect the less likely to be an entrepreneur.

The factor that we call Outgoing Attitude is the factor that has more items. The six items included represents 70% of the total variance of the factor. What we find in common in these factors is that it requires a proactive and outgoing attitude, to negotiate, to manage

Table 6. *Personality Variables*

Variable		Questions included in the index	
Risk aversion	14.06	Not having a steady income every month	0.4285
	14.07	Having to cope with business risks	0.3809
Social Aversion	14.13	Having to go out and sell products or services	0.3241
	14.14	Having to negotiate with others	0.2542
Outgoing attitude	14.09	Having to be proactive (i.e. own initiative)	0.5020
	14.10	Having people whose work and income depends on me.	0.5025
	14.11	Learn about activities of a business or organization	0.6109
	14.12	Having to manage multiple activities of a company or organization.	0.6013
	14.13	Having to go out and sell products or services	0.4331
	14.14	Having to negotiate with others	0.5696
Flexibility Desire	14.01	Being my own boss	0.4324
	14.02	Having flexibility with hours / holiday	0.5065
	14.03	Having the opportunities of earning more incomes	0.4781
	14.04	Doing what I like	0.3970
Effort Aversion	14.08	Having to work more than 9 hours a day	1.0000

business activity, or to manage people. We might expect that the higher the value in the Outgoing Attitude index, the more likely the person is an entrepreneur.

Flexibility desire shows to what extend the individuals want to manage their own time and be their own boss. The higher the index, the higher the desire for flexibility or independence, and we would expect the more likely to be an entrepreneur.

The fifth personality variable we created we call it "Effort Aversion" and it is a dummy variable taking one based on the statement "14.08 Having to work more than 9 hours a day." As entrepreneurship requires high effort, we would expect here a negative relationship between this index and the probability of becoming an entrepreneur.

Table 7 shows the value for each index for those who are currently entrepreneurs and for those who have entrepreneurial intent. The comparison is in line with the hypotheses stressed before: entrepreneurs or those who have the intent have: a more outgoing attitude, more desire for flexibility, less risk aversion, less social aversion, and less effort aversion.

Table 8 explores the differences between males and females. We find that there are significant differences only in Outgoing Attitude (men score higher), Risk Aversion (women are more risk averse on average), Social Aversion (women score higher), and Effort Aversion (women are less willing to work more than nine hours in their jobs). As there are significant differences, we might therefore expect that personality variables are going to be important to explain the gender gap.

Entrepreneurial exposure. We measure entrepreneurial exposure based on the question "Q13. Do you know someone who has launched a business?" We define three variables:

- Without-exposure, those who do not know any entrepreneur.
- Family-exposure, if some relative has ever started up a business
- Other-exposure, if they do not have relative but they know somebody who has ever started up a business.

Table 7. *Personality Characteristics*

Personality Variable	Index range and mean value				Entrepreneurial Intent		Entrepreneur	
	Mean	St Dev	Min	Max	No	Yes	No	Yes
Outgoing attitude	0	0.845	-2.18	3.16	0.13	-0.18	0.02	-0.31
Flexibility Desire	0	0.741	-3.27	0.90	-0.05	0.07	-0.01	0.17
Risk Aversion	0	0.564	-1.90	0.90	0.03	-0.04	0.01	-0.11
Social Aversion	0	0.682	-1.53	1.72	0.09	-0.12	0.02	-0.28
Effort Aversion	0.06	0.243	0	1	0.04	0.47	0.06	0.34

Table 8. *Gender Differences in Personality Characteristics*

Personality Variable	Mean score		P-Value for equality of mean test:		
	Female	Male	H0: equal mean	H0: male<female	H0: male>female
Outgoing attitude	0.0429	-0.0427	0.0234	0.9883	0.0117
Flexibility Desire	0.0037	-0.0040	0.8227	0.5886	0.4114
Risk Aversion	0.0198	-0.0197	0.1172	0.9410	0.0590
Social Aversion	0.0297	-0.0296	0.0516	0.1310	0.0259
Effort Aversion	0.0670	0.0586	0.0258	0.9870	0.0129

Exposure increases awareness, but also might have effects on human capital, social capital, and the psychology of the individual. Lazear (2004) pointed out that entrepreneurship requires a wide range of skills that usually are not trained at the school. Having a friend of relative who is an entrepreneur can help the individual to develop this set of skills. There is also evidence for the positive influence of parental role models on entrepreneurship (e.g., Fairlie & Robb, 2007). Networks (e.g., Klyver, Hindle, & Schott, 2007) and peer groups (e.g., Giannetti & Simonov, 2009; Markussen & Røed, 2017) also influence the decision to become entrepreneur and may provide role models.[11] Bosma, Hessels, Schutjens, Van Praag, & Verheul (2012) found that role models matter for the entrepreneurs, and they can compensate for a lack of entrepreneurial experience. They stressed that the dominant function of role models is "learning by example." Further, important functions are "learning by support," "increasing entrepreneurial self-efficacy," and "inspiration/motivation," as predicted by social learning theory and role identification theory.

Table 9 shows the descriptive statistics for our exposure variables for the entire sample, for the subset of current entrepreneurs, and for those who started up but quitted. First looking at the entire sample, we find there are not significant differences between men and women in exposure: 66% of women and 62% of men do not have any entrepreneur among family or friends. In the case of current entrepreneurs, only 33% have no exposure, and for the failed entrepreneurs 38%.

For both male and female, the current entrepreneurs have more exposure to family than failed entrepreneurs, what might indicate that success is correlated with exposure. This is more significant for females. On one hand, 60% of female entrepreneurs who have succeeded have an entrepreneur in the family. On the other hand, 40% of the female who tried and quit do not know any entrepreneur. This seems to show that exposure is even more critical for success for females than males.

Family background. Wealth might be an important predictor of entrepreneurship, particularly in developing countries where there are financial constraints.[12] To measure wealth, we compute a proxy-mean variable using factor analysis on the household assets and belongings.[13] The index, called SES, has a zero mean and a standard deviation of 0.8 (for the entire population). For the group of youths that are

Table 9. *Gender Differences in Exposure*

Exposure	Sample			Current Entrepreneurs			Failed Entrepreneurs		
	Total	Female	Male	Total	Female	Male	Total	Female	Male
Family	24%	25%	23%	49%	60%	42%	28%	24%	35%
Friend	12%	10%	14%	18%	13%	22%	33%	32%	35%
None	64%	66%	62%	33%	28%	36%	38%	44%	31%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 10. *Wealth (SES Index) & Entrepreneurial Choice*

	Mean	Standard Deviation
Population	0	0.80
Not Entrepreneurs	0.021	0.80
Entrepreneurs	0.223	0.78
Failed-Entrepreneurs	0.033	0.83

entrepreneurs, this mean is 0.223, significantly larger (at 1% significance level) than non-entrepreneurs (0.021). Failed entrepreneurs, on the other hand, have a mean wealth similar to non-entrepreneurs (we cannot reject the null hypothesis that both means are equal).

Results

Current Entrepreneurial Propensity

First, we study the incidence of entrepreneurship using as definition current business owners (a dummy taking one if the individual has currently a venture). Table 11 shows the results for our probit model with different specifications. In the first model, all the variables are statistically significant with the expected signs. The older the individual, the more educated and the wealthier, the more likely is an entrepreneur.[14] Males are more likely to be entrepreneur.

The second model incorporates the exposure of the individual to entrepreneurship with two variables: a dummy taking 1 if a relative has been an entrepreneur (Family Exposure) and a dummy taking 1 if the individual does not have any entrepreneur in the family or among his/her friends (Without Exposure). The excluded category is those who have at least one friend who been entrepreneur. Both variables are statistically significant and with the expected sign. The only change in the model is that now family

Table 11. *Entrepreneurial Choice. Probit Estimation*

	Model I			Model II			Model III		
	Coef.	Robust Standard Error		Coef.	Robust Standard Error		Coef.	Robust Standard Error	
Age	0.07	(0.015)	***	0.07	(0.016)	***	0.06	(0.016)	***
Edu-Primary	3.59	(0.100)	***	3.65	(0.143)	***	3.85	(0.148)	***
Edu-Secondary	3.73	(0.096)	***	3.75	(0.139)	***	3.93	(0.138)	***
SES	0.15	(0.060)	**	0.08	(0.062)		0.07	(0.063)	
Male (=1)	0.17	(0.094)	*	0.18	(0.097)	***	0.14	(0.098)	
Exposure									
Family Exposure				0.29	(0.145)	*	0.29	(0.147)	*
Without Exposure				-0.39	(0.142)	**	-0.35	(0.147)	**
Personality Variables									
Outgoing attitude							0.03	(0.103)	
Flexibility Desire							0.10	(0.076)	
Risk Aversion							-0.07	(0.084)	
Social Aversion							-0.23	(0.120)	*
Effort Aversion							-0.23	(0.099)	**
Emancipated (=1)									
Constant	-6.71	(0.341)	***	-6.70	0.41	***	-6.71	(0.413)	***
N =	1993			1993			1,993		
Wald chi2(12) =	2054			1055			1426		
Prob> chi2 =	0			0			0		
McKelvey and Zavoina's R2:	0.209			0.263			0.293		
McFadden Pseudo R2	0.051			0.098			0.119		

Note: *,**,*** indicate significance at 10,5 and 1%, respectively.
(Dependent variable =1 if the individual is an entrepreneur)

wealth (SES) becomes non-significant, as there is correlation between exposure and wealth (individuals with no exposure have an average SES of -0.71, whereas those who have a family member who has been entrepreneur the SES index is 0.27, a distance between both of 1.2 standard deviations).

The third model adds the five personality variables we created. The explanatory power of the model, according to the McFadden pseudo R2, increases (the count R2 is high, 0.942) but only two are statistically significant: Social Aversion and Effort Aversion. The more socially avert and the more effort avert, the less likely the individual is an entrepreneur.

Gender Gap in Current Entrepreneurship

Next, we run the individual probit models for each subgroup, women and men, and perform the Oaxaca-Blinder decomposition, as described by Bauer and Sinning (2008). We run this for the models I to III to see to what extent the usually missing personality variables are affecting the gender gap.

Table 12 shows the results of the probit models for the three specifications. Pseudo R2s are slightly higher for the women group. The signs of the coefficients are the same for the models I and II, although the estimated values are different. Family exposure is statistically significant for females, with the expected positive sign, but not for males. As the excluded category is friend exposure, this means that for males it is not critical to have an entrepreneur in the family because a friend entrepreneur has a similar effect on the probability (i.e. family or friend exposure has the same positive effect). For females, family exposure to entrepreneurship has a (statistically significant) larger effect on the probability than friend exposure.

For Model III, which adds the personality variables, we find that none of these variables are statistically significant to explain the probability of becoming entrepreneur for females. On the contrary, for males we

Table 12. *Entrepreneurial Choice. Probit Estimation by Gender*

	Model I				Model II				Model III			
	Male		**Female**		**Male**		**Female**		**Male**		**Female**	
Age	0.068	***	0.0659	***	0.067	*	0.073	***	0.059	***	0.0716	***
Edu-Primary	4.584	***	4.4351	***	4.485	***	4.935	***	4.692	***	4.9810	***
Edu-Secondary	4.666	***	4.6740	***	4.512	***	5.130	***	4.710	***	5.1581	***
SES	0.184	**	0.0949		0.125		0.033		0.108		0.0215	
Exposure												
Family Exposure					0.180		0.431	*	0.158		0.4603	*
Without Exposure					-0.361	***	-0.427	*	-0.311	*	-0.3786	
Personality Variables												
Outgoing attitude									0.131		-0.1493	
Flexibility Desire								*	0.203	**	-0.0122	
Risk Aversion									-0.125		-0.0263	
Social Aversion								***	-0.343	**	-0.0341	
Effort Aversion									-0.224	*	-0.2391	
Constant	-7.52	***	-7.58	***	-7.244	***	-8.150	***	-7.265		-8.0979	
N =	999		994		999		994		999		994	
Wald chi2(12)　=	1128		1032		1260		543		405		545	
Prob> chi2　=												
McKelvey and Zavoina's R2:	0.198		0.207		0.229		0.311		0.273		0.315	
McFadden Pseudo R2	0.046		0.052		0.073		0.129		0.110		0.150	

(Dependent variable =1 if the individual is an entrepreneur)

find several factors with statistically significant effects. Particularly, we find a statistically significant effect for the flexibility desire, social aversion, and effort aversion in the direction we were expecting (more flexibility desire, more likely to become entrepreneur; more social and effort aversion, less likely to become entrepreneur).

When splitting the sample in two, one possible explanation for the gender difference in the effect of personality variables on the probability of being an entrepreneur could be lack of variation in the variables in one of the subsamples. This is not the case, as the standard deviation and range of each personality factor is similar for each gender group.[15] Neither is the case of small sample size, as both have relatively the same size. The result is neither driven by collinearity. If we eliminate all the controls except age and the personality variables, still personality variables are not statistically significant for females and statistically significant for males. Therefore, the results do not look to be driven by the sample partition, but rather related to real gender differences.

As we are analyzing current entrepreneurs, those who are really running a business, one explanation for this differential effect might be related with females facing other constraints to start-up, constraints that are not captured in our model. In particular, we find

that family exposure is important for females but not for males, and personality variables are important for males but not for females. This might be showing that the first order effect for females is family exposure, more than personality. Family exposure and personality factors are not correlated,[16] therefore we find two different driving forces to explain entrepreneurship for males and females. In fact, if we compare model II and I for males and females in Table 12, we do see that the pseudo R2 increases more for females than males, what means including exposure improves the explanatory power of the model for females more than for males, and the opposite is true when we include personality variables (model III vs model II) where the larger increase in pseudo R2 is for males.

Next, to understand to what extent these differences are responsible for the gender gap, we performed the Oaxaca-Blinder decomposition for the nonlinear probit model. Table 13 shows the results. First row shows the decomposition in two components: the explained part (differences in resources) and the unexplained part (differences in coefficients). As mentioned before, we use as the base case scenario for our analysis a value of 1 for omega (Equation 3), what implicitly assumes that there is no discrimination in males–or that discrimination occurs exclusively on females. Nevertheless, we also include two other popular

Table 13. *Oaxaca-Blinder Decomposition by Gender. Current Entrepreneurs*

	Model I		Model II		Model III	
	Coef.	**%**	**Coef.**	**%**	**Coef.**	**%**
Omega=1						
Observed Effect(char)	0.0040	18.60%	0.0057	26.12%	0.0097	44.27%
(Unobserved Effect (coef.)	0.0177	81.40%	0.0161	73.88%	0.0122	55.73%
Omega=0.5 (Cotton)						
Char	0.0025	11.45%	0.0040	18.52%	0.0078	35.82%
Coef. Advantage	0.0112	51.22%	0.0109	50.09%	0.0098	45.15%
Coef. Disadvantage	0.0081	37.33%	0.0068	31.39%	0.0042	19.03%
Omega=Neumark						
Char	0.0031	14.09%	0.0047	21.62%	0.0086	39.55%
Coef. Advantage	0.0093	42.85%	0.0085	39.06%	0.0066	30.18%
Coef. Disadvantage	0.0094	43.06%	0.0086	39.33%	0.0066	30.26%
Raw	0.0218	100%	0.0218	100%	0.0218	100%

weighting scheme for reference: Cotton (1988) and Neumark (1988) (Equation 4). The results of these more complex weighting schemes go in the same direction as the simple case, with omega equal 1: including exposure and personality variables reduce the unobserved effect.

The entrepreneurship rate for each subsample is 6.89% (males) and 4.71% (females), what gives a gender gap in favor of males of 2.18%. The results show that both the endowments and the unexplained effects work in the same direction, increasing the gap in favor of men. But the unexplained effect is much lower once we include the new controls, showing that an important fraction of the unexplained effect was due to the lack of exposure and personality variables, variables that usually are not available in standard household surveys.

For instance, according to the specification of Model I, which does not include exposure to entrepreneurship and personality variables, the characteristics can explain 18.6% of the gap. If female and male would have the same background in these variables, the gap will reduce from 2.18% to 1.77%. Most of the gap cannot be explained by the difference in these variables (education, age, and wealth). The unexplained part is due more to advantages of males than disadvantages of females, according to the weighting scheme proposed by Cotton (1988), and equally distributed according to the Neumark (1988) approach.

Model II adds the exposure variables (but not the personality variables). Including the exposure to entrepreneurship variables reduces the unexplained part of the gap more—26.12% is now explained by the differences in characteristics and 73.88% unexplained.

Finally, Model III includes the personality variables, and we observed an increase in the observed effect and a reduction of the unexplained effect. Now differences in endowment are responsible for 44.27% of the raw gap, compared to just 18.6% in Model I. If women´s endowments were equalized to men in all the variables we study, still the gap would be 1.22%, almost half the original gap (2.18%), but we still observe a gap.

As discrimination is usually associated with the unobserved effect of the Oaxaca Blinder decomposition, and the variables we use did not explain the gap completely, we cannot rule out the presence of gender discrimination in Argentina, but if present it cannot represent more than 55% of the observed gap.

Entrepreneurship, Failure and Gender Gap

Next, we analyze a more general definition of entrepreneur which includes current entrepreneurs and those who started up a business and failed. In our sample, we have 116 individuals who are currently entrepreneurs and 73 who tried, failed, and now are unemployed (15), working (36), or studying (22). Half of these failed entrepreneurs would like to start up again in the future.

As in the previous section, we are interested in the gender gap and how this gap is decomposed in explained and unexplained effects. Results are presented in Table 14.[17] The first interesting result is that the gap is smaller, just 1.36% (compared to 2.18% for current entrepreneur). The second interesting result is that most of this difference can be explained by the differences in the endowments. In model I, the endowments explain only 34% of the gap, but once we add exposure the explained effect is 63%, almost double. Personality variables increased the explained effect to 86%. The effect of exposure and personality variables in reducing the unexplained effect is more important here than in current entrepreneur.

Most studies on entrepreneurship gap focus on current entrepreneurs, those who currently have a venture. There are many entrepreneurs that did start up and failed, but standard surveys do not collect information on them, and therefore they focus only on the survivors. By working with a broader definition of entrepreneur, we find that in Argentina at the moment of starting up there is little room for gender discrimination, as the gap can be almost fully explained by the observed characteristics (especially exposure and personality). On the other hand, the fact that the gender gap increases when we analyze current entrepreneurs shows that failure is more likely for female entrepreneurs (see Table 14).

To explore in more detail this last result, we run a probit model for failure (a dummy taking 1 if the person has not a venture currently but had one in the past). As we are studying whether the individual was an entrepreneur but not anymore, we are not looking exactly at the cause of failure of the venture, but at the decision (or fact) of the individual to leave the status of entrepreneur. It is important to point out that many entrepreneurs who are currently running a business have reported failures in the past. These individuals did not leave the status of entrepreneurs, they tried with a different venture. In addition, many

Table 14. *Oaxaca-Blinder Decomposition by Gender. Entrepreneurs*

	Model I		Model II		Model III	
	Coef.	**%**	**Coef.**	**%**	**Coef.**	**%**
Omega=1						
Observed Effect(char)	0.0046	34.14%	0.0085	62.48%	0.0118	85.77%
(Unobserved Effect (coef.)	0.0090	65.86%	0.0051	37.52%	0.0020	14.23%
Omega=0.5 (Cotton)						
Char	0.0046	33.48%	0.0090	65.94%	0.0130	94.36%
Coef. Advantage	0.0062	45.32%	0.0038	28.11%	0.0026	19.12%
Coef. Disadvantage	0.0029	21.20%	0.0008	5.95%	-0.0019	-13.48%
Omega=Neumark						
Char	0.0046	34.01%	0.0086	63.58%	0.0127	92.58%
Coef. Advantage	0.0045	32.91%	0.0025	18.13%	0.0005	3.50%
Coef. Disadvantage	0.0045	33.08%	0.0025	18.29%	0.0005	3.92%
Raw	0.014	100%	0.014	100%	0.014	100%

Table 15. *Probit Model for Entrepreneurship Failure*

	Coef.	Robust Standard Errors	
Male (=1)	-0.478	0.219	**
Age	0.014	0.038	
Edu-Primary	-4.352	1.368	***
Edu-Secondary	-4.407	1.356	***
SES	-0.024	0.148	
Exposure			
Family Exposure	-0.667	0.281	**
Without Exposure	-0.254	0.276	
Personality Variables			
Outgoing attitude	0.014	0.185	
Flexibility Desire	-0.137	0.146	
Risk Aversion	0.118	0.177	
Social Aversion	0.084	0.212	
Effort Aversion	0.231	0.234	
Constant	3.549	1.720	**
N =	176		
Wald chi2(12) =	547		
Prob> chi2 =			
McKelvey and Zavoina's R2:	0.296		
McFadden Pseudo R2	0.1074		

Table 16. *Oaxaca-Blinder Decomposition for Failure*

	Model I		Model II		Model III	
	Coef.	%	Coef.	%	Coef.	%
Omega=0						
Observed Effect(char)	0.002	-1.55%	0.018	-11.90%	0.011	-7.23%
(Unobserved Effect (coef.)	-0.150	101.55%	-0.167	111.90%	-0.164	107.23%
Omega=0.5 (Cotton)						
Char	-0.009	5.99%	0.009	-5.83%	0.001	-0.41%
Coef. Advantage	-0.054	36.39%	-0.063	42.42%	-0.047	30.56%
Coef. Disadvantage	-0.085	57.62%	-0.095	63.41%	-0.107	69.84%
Omega=Neumark						
Char	-0.016	11.17%	-0.001	0.34%	-0.014	9.44%
Coef. Advantage	-0.06	40.60%	-0.067	45.04%	-0.063	41.25%
Coef. Disadvantage	-0.071	48.23%	-0.081	54.62%	-0.075	49.31%
Raw	-0.15	100%	-0.15	100%	-0.15	100%

of the failed entrepreneurs still want to have a venture in the future.

Table 15 shows the probit results for the failure rate. The dependent variable takes 1 if the person has not a venture currently but had one in the past, and the sample is reduced to only those who have ever started up a venture (failed entrepreneurs + current entrepreneurs). We are therefore analyzing the failure rate. The results show that none of the personality variables are statistically significant to explain failure. Neither age nor family wealth (SES) is statistically significant. The latter is surprising as we might have expected that family wealth might help by providing an internal source of finance in a country like Argentina, were there are financial constraints. The only variables which are statistically significant to explain the failure are education (the more educated the entrepreneur the less likely to fail), family exposure (if they have a relative who is or was an entrepreneur, the less likely to fail), and gender (males are less likely to fail). Count R2 is just 0.68, much lower than the probit estimation for the current entrepreneurship rate (0.94).

Table 16 does the Oaxaca-Blinder decomposition for the probit model that explains failure. On average,

out of all the individuals who reported to have ever started up, 34% have failed. For women, this ratio is 42%, whereas for men just 27%, showing a gender gap of 15%. The results show that endowment cannot explain much of this gap. On the contrary, equalization of endowment would increase the gap. This is because education has a negative impact on failure (see Table 15), and female entrepreneurs have more years of education, on average, than males (see Table 3). In other words, we do not observe a larger gap in failure because more educated females are compensating the unobserved effects. If we equalize education, the gap would be larger and not lower. This explains the negative sign for the Observed Effect in the Model I.

Something similar occurs for family exposure—female entrepreneurs have more exposure on average than males, equalizing exposure would also increase the gap rather than reduce it. This explains why Model II, which includes exposure, has an even more negative Observed Effect.

Finally, personality variables work in the opposite direction. Although they are not statistically significant in the probit model for the failure rate, equalization of personality variables would mean a less negative Observed Effect (model III).

As males and females choose different economic sectors for their ventures, it might be due to the fact that a set of dummies for the economic sector are missing variables in our model. Unfortunately, our data set only describes the economic sector for the current entrepreneurs, data that show us that females are more dominant in retail and males in agriculture, mining, and construction. Nevertheless, in our econometric analysis we are not analyzing whether the venture failed but whether the entrepreneur left this status. The economic sector is an endogenous decision of the entrepreneur, probably affected by their knowledge and exposure. It might be true that there is gender specific knowledge that makes one sector more attractive than another. If these sectors are more volatile or have higher turnover rates, the failure probability could be higher. It is still true that the entrepreneurs can choose to start up another venture, but their previous experience could condition the choice. Regrettably, these are hypothesis that we cannot test in our data, and they are open questions for future research.

Conclusions

We study gender gap in entrepreneurship in small towns of Argentina using CBMS data. Our econometric methodology is to decompose the gap in observable and unobservable factors following Oaxaca-Blinder decomposition for nonlinear (probit) models, as proposed by Bauer and Sinning (2008).

The Argentine case has not been deeply analyzed before due to the lack of appropriate data. Most econometrics analyses were based on household surveys that were not designed to study youth entrepreneurship. In particular, variables that are important to explain the entrepreneurial decision such as exposure and personality were not available before. Based on CBMS data, we constructed these variables using factor analysis. In addition, CBMS also asked about previous experiences with entrepreneurship which allowed us to study a much less explored topic: success.

A stylized fact is that Latin America has the lowest gap between women and men in entrepreneurial intent (those willing to start up a business), but the gap increases when we look at entrepreneurship event (Singer et al., 2014). Our study shows that the gender

gap after the event (starting up) increases even more because women are more likely to quit the venture.

Furthermore, our Oaxaca-Blinder decomposition shows that, at the event of starting up, the gender gap against women can be fully explained by the personality variables. After including the exposure and personality variables, the unexplained effect is negligible. Women are less likely to start up because of their personality characteristics. But the same cannot be said for the success or failure. The gender gap in the failure rate (entrepreneurs that quit the venture) is much larger in women (42%) compared to men (27%). The Oaxaca-Blinder decomposition results show that the control variables are not responsible for the gap, as this gap is largely unexplained. A probit model for failure shows that education and exposure (having a family member who is also entrepreneur) are the only variables which are statistically significant to explain the probability that an entrepreneur quits. None of the personality variables help to explain the failure, neither family wealth.

As a consequence of the gender gap in the failure rate, the gender gap in current entrepreneurship (the survivors) is larger than at the gender gap at the event of starting up (55% larger).

These results show the need to further study the gender gap in the failure rate. There are several plausible hypotheses. For instance, the large unexplained effect could be related to discrimination, to some difference in endowment that our controls do not capture or a gender effect in the self-selection of the economic sector for the venture. It can be also be related with the dynamic of the family and the labor market.

In terms of policy prescriptions, as Vossenberg (2013) pointed out, support programs to close the gender gap in entrepreneurship are deploying a variety of instruments and methodologies, ranging from entrepreneurial skill training; business development services (BDS) and technical support; to capacity development, empowerment, and the provision of credit and investment funding. For instance, the World Bank´s Women Entrepreneurship Development Project for Ethiopia uses as the main instruments credit provision and financial training, entrepreneurial and technical skills development, and technology and product development support. The results of our work show that policies, at least in Argentina, should pay more attention at the selection of the startup and the support in the early stages to revert the very high failure

rate for women, as the entrepreneurship gap is created because of large difference in the survival rate, more than at the event of starting up. Promoting more new ventures led by females would not solve the gender gap if the higher failure rate is not addressed.

Acknowledgment

Notes

1   This result is related to Verheul, Thurik, Grilo, and Van der Zwan (2012). They treated the entrepreneurial process as a two-step procedure: the cognitive stage of "wanting it" and the behavioral stage of "doing it". Based on evidence from 29 developed countries, they found that women's lower preference for becoming self-employed plays an important role in explaining their lower involvement in self-employment (the event), but there are also gender specific obstacles (like industry and entrepreneurial experience, household and family, skills, and knowledge).

2   A large middle class has been postulated as the cradle of entrepreneurship (Landes, 1998; y Maddison, 2007, as cited in Anchorena & Ronconi, 2012). The usual argument posits that middle-class individuals have the resources and values to postpone gratification and reap the long-term benefits of innovation (Anchorena & Ronconi, 2012).

3   In the case of Argentina, they used the survey called EPH. This is a standard labor market condition survey, designed to measure unemployment and activity rate. As Argentina does not have a living condition survey, EPH is also used to measure poverty, following the income line approach.

4   On average, employer-entrepreneurs manage businesses of nine workers (the median is only four), while self-employed entrepreneurs work in firms of three persons, on average (with medians of only two). On average, employees work in firms of around 120 employees, though the median is only 18. A large share of entrepreneurs owns or rent equipment/

machinery, though the share is larger for employer-entrepreneurs than for self-employed entrepreneurs. The share is, however, much smaller for the purely self-employed. Almost none of the self-employed own equipment/machinery valued at higher than US$15,000, and only slightly more than 5% of entrepreneurs' own equipment/machinery.

5   Both, Anchorena and Ronconi (2012) and Kantis et al. (2012) are the results of the IDB Research Department project called "Strengthening Mobility and Entrepreneurship: A Case for the Middle Classes".

6   This result coincides with the empirical literature on entrepreneurship, which establishes a positive relationship between age (as a proxy of experience) and the accumulation of entrepreneurial human capital (i.e., motivations, skills, and capabilities), which are linked to entrepreneurial propensity (Colombo & Grilli, 2005; Gimeno, Folta, Cooper, & Woo, 1997).

7   2014/15 CBMS-Argentina was administrated in seven small towns of the municipality of Olavarría in the province of Buenos Aires (Colonia Hinojo, Colonia San Miguel, Hinojo, Sierra Chica, Sierras Bayas, Villa A. Fortabat, and Villa Mi Serranía) and in the northern part of the city of Tandil (also in the province of Buenos Aires). Tandil and Olavarría are two very dynamic municipalities of the largest province in Argentina, Buenos Aires. They are very close in distance and have similar origins, influenced by the large flow of immigrants that came to Argentina in the late 19th and early 20th century. The main economic activity in Olavarría today is mining, followed by agriculture. Tandil has a more balanced economy, with agriculture, tourism, and software industry as the most important economic activities. Because of the influence of immigrant, these cities have been very dynamic and entrepreneurship has been high.

8   We classify and individual as a potential entrepreneur if he/she is not an entrepreneur but choose the options 1 to 4 in this question:

1-Having your own business without partners or employees (self-employed)

2-Having your own business without partners, but with employees

3-Having your own business with partners but no employees

4-Having your own business with partners and employees

9   Our paper is related to Caliendo, Fossen and Kritikos (2014) and Bernat et al. (2017), who also studied gender gap in entrepreneurship by following a non-

linear version of the Oaxaca-Blinder decomposition. Caliendo et al. (2014) used the methodology for discrete dependent variables proposed by Yun (2004; 2005a, 2005b; 2008), whereas Bernat et al. (2017) followed Fairlie's decomposition method (Fairlie, 2005).

[10] There is evidence that entrepreneurs are less risk averse than other persons, such as those who are regularly employed (Stewart & Roth, 2001; Hartog, Ferrer-i-Carbonell, & Jonker, 2002). But there is also evidence that too much risk tolerance is not good for survival. In particular, Caliendo et al. (2014) found empirical evidence that there is no linear relationship between risk tolerance and entrepreneurial success: persons with particularly low or particularly high-risk attitudes survive as entrepreneurs less often than those with a medium-level risk attitude.

[11] Markussen and Røed (2017) studied how early career entrepreneurship is affected by existing entrepreneurship among neighbors, family members, and recent schoolmates. Based on an instrumental variables strategy, they identified strong and heavily gendered peer effects. While men are more influenced by other men, women are more influenced by other women. They estimate that differences between male and female peer groups explain approximately half of the gender gap in early career entrepreneurship.

[12] Capital constraint is an important limiting factor of entrepreneurship even in developed economies (see Blanchflower & Oswald, 1998).

[13] We measure family wealth by the proxy mean methodology based on question O9, which asks about household belongings and durable goods. This question includes 14 items. To construct a household wealth proxy variable, we use factor analysis with these 14 variables. The first factor explains 100% of the variance, and the histogram for this factor looks log normal, as it is usually the case with income and wealth distributions. We estimated family wealth based on this factor.

[14] For education, the excluded category is primary incomplete, and we did not include university degree because we are using a sample of youth who most of them have not finished.

[15] Results available from authors.

[16] If we run a probit regression for family exposure on personality variables, pseudo R2 are extremely low, 1.15% for females and 2.4% for males. Results are available from the authors.

[17] We omit the probit estimation in the paper to simplify the presentation, results are available from the author.

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Appendix

Table 17 shows the results of the factor analysis done with the 14 variables that emerge from question 14 as explained in Table 5 of the main text. The second table show the factor loads. In the main text, we include the factor load used for each indicator. This factor loads emerge from a restricted factor analysis.

Table 17. *Factor Analysis for Question 14*

Factor analysis/correlation		Number of obs =	1999	
Method: principal factors		Retained factors =	6	
Rotation: (unrotated)		Number of params =	69	

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	2.19602	0.99974	0.7199	0.7199
Factor2	1.19628	0.71599	0.3921	1.1120
Factor3	0.48028	0.21308	0.1574	1.2694
Factor4	0.26720	0.15818	0.0876	1.3570
Factor5	0.10902	0.09453	0.0357	1.3928
Factor6	0.01448	0.03148	0.0047	1.3975
Factor7	-0.01700	0.03680	-0.0056	1.3919
Factor8	-0.05380	0.07057	-0.0176	1.3743
Factor9	-0.12437	0.02210	-0.0408	1.3335
Factor10	-0.14647	0.02331	-0.0480	1.2855
Factor11	-0.16978	0.03387	-0.0557	1.2299
Factor12	-0.20365	0.02729	-0.0668	1.1631
Factor13	-0.23094	0.03570	-0.0757	1.0874
Factor14	-0.26664	.	-0.0874	1.0000

LR test: independent vs. saturated: chi2(91) = 4161.65 Prob>chi2 = 0.0000

Factor loadings (pattern matrix) and unique variances

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Uniqueness
y14_1	0.2182	0.4324	0.1760	0.0313	-0.1119	-0.0134	0.7207
y14_2	0.0994	0.5065	0.1396	0.0758	-0.1234	-0.0095	0.6930
y14_3	0.3048	0.4781	0.0788	0.0520	0.0472	-0.0260	0.6667
y14_4	0.1578	0.3970	0.0659	0.0460	0.1573	0.0201	0.7859
y14_5	0.3550	0.2466	-0.0108	-0.0478	0.1780	0.0368	0.7777
y14_6	0.0024	-0.2057	0.4285	0.0443	-0.0049	0.0448	0.7701
y14_7	0.2511	-0.2952	0.3809	0.0092	0.0104	0.0067	0.7045
y14_8	0.2832	-0.3258	0.1745	-0.0120	0.0730	-0.0535	0.7749
y14_9	0.5020	-0.0817	-0.0615	-0.1140	0.0526	-0.0422	0.7200
y14_10	0.5025	-0.0332	0.0850	-0.1376	-0.0291	-0.0321	0.7184
y14_11	0.6109	-0.0016	-0.1128	-0.2041	-0.0447	0.0298	0.5695
y14_12	0.6013	-0.0823	-0.0824	-0.0892	-0.1039	0.0494	0.6037
y14_13	0.4331	-0.1760	-0.1159	0.3241	0.0090	0.0201	0.6625
y14_14	0.5696	-0.1568	-0.1267	0.2542	-0.0261	-0.0181	0.5692

For instance, the factor 1 that we call "Outgoing attitude" we use the six items that represents 70% of the total. What we find in common of these factors is that it requires a proactive and outgoing attitude, to negotiate, to manage business activity, or to manage people.

14.09	Having to be proactive (i.e. own initiative)	0.5020
14.10	Having people whose work and income depends on me.	0.5025
14.11	Learn about activities of a business or organization	0.6109
14.12	Having to manage multiple activities of a company or organization.	0.6013
14.13	Having to go out and sell products or services	0.4331
14.14	Having to negotiate with others	0.5696

To obtain the index we run factor analysis only with these six items and predict the first factor. The index was built such that the higher the value, the more outgoing attitude has the individual. The weights use for each variable in the construction of Outgoing Attitude are shown in the next table

Weight used to create the variable		
14.09	Having to be proactive (i.e. own initiative)	0.17545
14.10	Having people whose work and income depends on me.	0.16104
14.11	Learn about activities of a business or organization	0.26174
14.12	Having to manage multiple activities of a company or organization.	0.25525
14.13	Having to go out and sell products or services	0.16978
14.14	Having to negotiate with others	0.25459