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Skills Mismatch and its economic implications: Self study in Argentina

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1. Introduction

Undoubtedly, skills form the very basis of every economy. However, in order to be fruitful and ensure prosperity, they must be put to effective use in the work place. Ensuring an appropriate match between the skills possessed by workers and the ones required by their jobs is essential to fully utilize human capital and thus, to promote economic growth.

In the past, most of the debates and concerns were related to the issue of *skill shortages*. Although this problem has not disappeared, the most important challenge in the labor market nowadays seems to be another one: the misplacement of the existent skills.[1] The growing concern of this issue is revealed on one hand by the current shift in policy interest towards it. On the other hand, it is supported by the fact that numerous international organizations have recently defined this issue as one of their priorities. For example, *The Bordeaux Communiqué* was carried out in 2008 by the European Ministers of vocational education and training, the European Social Partners and the Commission with the aim of defining priorities for 2008-2010. Among the priorities set for the European cooperation, this issue was included and initiatives regarding it were proposed.[2]

The phenomenon that involves the misplacement of skills is commonly known as *skills mismatch* and just as its name implies, it takes place when there is a discrepancy between the skills possessed by a worker and the skills required by his/her job.[3] When workers possess more skills than the ones required by their jobs, they are considered to be *over-skilled*. This first scenario of skills mismatch may also be known as *skill surplus* (or *skill underutilization*). On the other hand, when workers possess less or lower skills than the ones required by their jobs, they are considered to be *under-skilled*. This second case of skills mismatch may

[1] Desjardins, R. and K. Rubenson, (2011), "An Analysis of Skill Mismatch Using Direct Measures of Skills", OECD Education Working Papers, No. 63, OECD Publishing. http://dx.doi.org/10.1787/5kg3nh9h52g5-en

[2] Desjardins, R. (2014), "Rewards to skill supply, skill demand and skill match-mismatch", Lund, Sweden: Media-Tryck, Lund University.

[3] Quintini, G. (2011). *Right for the Job: Over-qualified or Under-skilled?* (No. 120). OECD Publishing.

also be called *skill deficit* (or *under-skilling*). In addition, evidence suggests that some socio-economic groups such as women, young people and immigrants, among others, are more likely to suffer skill mismatch than others.[4]

It is worth mentioning the fact that most of the academic studies have focused mainly on the phenomenon of *qualification* or *education mismatch* rather than skills mismatch. Significant differences exist between these two concepts. Contrary to the phenomenon of skills mismatch recently defined, qualification mismatch measures the discrepancy between the highest level of educational attainment obtained by a worker and the education level required by his/her job. This is to say, individuals would be considered "over qualified/educated" if they possess higher qualifications than the ones required by their jobs. On the other hand, the individuals that possess lower qualifications than the ones required by their jobs, would be considered "under qualified/educated". Although the qualifications of an individual, defined as the highest level of education obtained, may reflect some of his/her skills, they may not necessarily reflect all the set of skills that the individual actually possesses. In other words, the qualifications of an individual reflect just his/her certified skills. These skills are usually achieved during the years of formal education. However, new skills may be acquired later on the job and old skills may become obsolete or deteriorate over time. Thus, the highest level of educational attainment of an individual does not necessarily determine the skills that he/she may possess.[5] There may be clear gaps between the educational certifications and the actual competences that an individual possesses.

For this reason, it is important to keep in mind that although qualifications are considered to be a close proxy of skills, they are not perfect substitutes at all: vital differences exist between these two concepts and will be fully explained later in this paper. Nonetheless, one of the main reasons that explain the particular focus of studies on qualification mismatch is that measuring *skill* mismatch

[4] Quintini, G. (2011). Over-qualified or under-skilled: A review of existing literature. *OECD Social, Employment, and Migration Working Papers*, (121), 0_1.

[5] Quintini, G. (2011). *Right for the Job: Over-qualified or Under-skilled?* (No. 120). OECD Publishing.

between workers and their jobs is no simple task, there is limited data about this issue. On the other hand, measuring qualification mismatch is not only easier but also cheaper.

The aim of this study is to shed light on the phenomenon of *skills mismatch* and its extent in Argentina. More precisely, its extent in one of the most important and dynamic sectors of our country: the automotive industry.[6] This industry is not only one of the most significant industries of our country but also its work force encompasses a large variety of qualifications needed for the numerous stages of its production process. In addition, some studies have already shown that the phenomenon of skills mismatch is of great concern in the automotive industry of developing countries such as Philippines.[7]

It is also important to highlight the fact that this study has been motivated by several reasons. First of all, I've decided to concentrate on the phenomenon of *skills mismatch* rather than *education/qualification mismatch* because of the growing concern of this issue and the recent shift that policies have made from tackling over-education or skills shortages to principally addressing the phenomenon of skills underutilization.[8] As mentioned before, although qualifications/education levels are a close proxy of skills, they are not perfect substitutes. The term "qualifications" only considers the skills that are acquired during the years of formal education. This is to say, certified skills. However, skills may also be acquired and developed on jobs. In addition, skills may even deteriorate over time. For these reasons, individuals with the same highest educational attainment level may clearly possess different levels and set of skills. Moreover, another important motive that encourages this study is the severe macroeconomic impact that skills mismatch may have: it not only affects the individuals who are not well matched, but also the firms involved and ultimately,

[6] Invest in Argentina: Automotive Industry. (n.d.) Retrieved from: http://inversiones.gob.ar/

[7] Magkilat, B. (2016). *Job skills mismatch to dampen PH growth – study.* Retrieved from: http://www.mb.com.ph/job-skills-mismatch-to-dampen-ph-growth-study/

[8] Desjardins, R. and K. Rubenson (2011), *An Analysis of Skill Mismatch Using Direct Measures of Skills*, OECD Education Working Papers, No. 63, OECD Publishing. http://dx.doi.org/10.1787/5kg3nh9h52g5-en

the economies as a whole. Last but not least, I was encouraged to study the impact of this phenomenon in Argentina because much has been written about it in developed countries. However, there are not many studies that focus on skills mismatch in developing countries.

Several studies that utilize qualifications as a proxy for skills, reach to the conclusion that one in four workers of OECD countries is over-qualified while one over three is under-qualified. [9] Moreover, another striking fact published by an ILO study is that between the years 2002 and 2012, the proportion of over-qualified workers in Europe augmented by 3.6 percentage points while under-qualification was reduced in most of these countries. Most of the studies that attempted to calculate the incidence of skills mismatch in developed countries used the methodological method of self-reports. For example, Allen and Van Der Velden (2001) reached to the conclusion that at that time, skill under-utilization affected 14% of Dutch university graduates and 15% of Dutch tertiary graduates. On the other hand, Green and McIntosh (2007) found out that in 2001, 35% of the workers of Great Britain were over-skilled while 13% under-skilled. Although the majority of the existing studies analyze the situation of skills mismatch in developed countries, it is important to highlight that it is a problem that affects all the countries around the globe, including developing ones.[10]

As regards the measurement of this phenomenon, there is no universally accepted measure of skills mismatch today. Objective data on soft skills is not usually available. Thus, due to the fact that it is complicated to obtain data about skills mismatch and even more complicated to obtain data of this sort in developing countries such as Argentina, this study is going to use the self-reporting method to gather information of skills mismatch in the automotive industry. Particularly, a pilot self-report will be carried out to demonstrate how this phenomenon could be measured with the appropriate time and resources.

[9] Quintini, G. (2011). *Right for the Job: Over-qualified or Under-skilled?* (No. 120). OECD Publishing.

[10] International Labor Organization (ILO). (2014). *ILO reveals substantial skills mismatch in Europe*. Retrieved from: https://www.oximity.com/article/ILO-reveals-substantial-skills-mismatc-1

It is usually argued that people are the best-qualified witnesses of their own personalities, including the skills that they posses. In other words, people possess more information about themselves than anybody else, especially when talking about soft skills that are not easily measurable. [11] Therefore, one of the principal advantages of using the self-reporting method is the richness and high quality of the information obtained. In addition, another advantage of this method is its practicality. Since self-reports may be carried out with the use of surveys, this method is not only a simple but also a cheap source of information. Nevertheless, self-reports also present some particular disadvantages. Both the advantages and limitations of this methodology will be considered and outlined later in this study.

The paper is organized as follows. The next section will present the phenomenon of skills mismatch, highlight the main differences between this phenomenon and education/qualification mismatch and remark the importance of analyzing this issue. Section 3 will assess the consistency of the principal labor market theories with education and skill mismatch. In section 4, the methodological framework and different approaches to measure skills mismatch will be developed. Later, the causes and socioeconomic determinants of this phenomenon will be described in section 5. The following section 6 will summarize some previous and general findings about skills mismatch while section 7 will mainly concentrate on the current situation in Argentina. Finally, section 8 will present the results obtained by the self report carried out in this paper and the last section will draw some evaluations and explain the conclusions to which we arrived.

[11] Robins, R. W., Fraley, R. C., & Krueger, R. F. (Eds.). (2009). *Handbook of research methods in personality psychology*. Guilford Press.

2. The phenomenon of skills mismatch and the importance of its analysis

2.1 The concepts of skills and qualifications

Frequently, "qualifications" are considered to be one of the closest proxies for skills. Although both concepts conform individuals' human capital and their development plays an important role in economic growth, it is important to highlight the idea that significant differences exist between both terms.

On one hand, educational qualifications are defined as "the degrees, diplomas, certificates, professional titles and so forth that an individual has acquired whether by full-time study, part-time study or private study, whether conferred in the home country or abroad, and whether conferred by educational authorities, special examining bodies or professional bodies. The acquisition of an educational qualification therefore implies the successful completion of a course of study or training programme."[12] This definition suggests the idea that the term "qualifications" comprises the *certified* skills. This is to say, this term represents the skills that are obtained through formal training but does not consider skills acquired in other scenarios. For example, skills may be acquired through other methods that don't provide certifications such as on the job trainings and informal courses/workshops, among others. For this reason, it is clear that people with the same qualification level, may possess different levels of skills. Furthermore, an individual without any formal certification may even possess more skills than a highly qualified individual.

It is claimed that formal education may be considered the primary source of learning. Individuals who have completed higher levels of education will have spent more time studying and being instructed. Therefore, it seems natural to expect higher possession of skills among highly educated individuals. However, as previously stated, a higher educational level does not necessarily imply better or higher skills.

[12] Organization for Economic Co-operation and Development (OECD). (2001). *Glossary of Statistical Terms*. Retrieved from: https://stats.oecd.org/glossary/detail.asp?ID=744

On the other hand, skills are defined as abilities to perform an activity in a competent manner.[13] They may be developed in multiple sceneries and they usually tend to evolve with age and experience. Therefore, the definition of this term contributes to transmit the same idea emphasized before: skills may vary considerably among individuals who possess similar educational levels.

Skills can be classified in many different ways. One of the classifications most frequently used, distinguishes two different types of skills: *cognitive* and *non-cognitive skills*. Cognition is defined as the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses.[14] Thus, the first type of skills makes reference to those core abilities such as learning new ideas and comprises processes like memory, attention and reasoning, among others. On the other hand, the non-cognitive skills or the also called "soft skills", make reference to personal attributes such as persistence, self-discipline, teamwork and organization, among others.

This classification of skills and the explanation of each particular type help to shed light on the fact that skills are not determined solely by genetics; they can be fostered, developed and shaped over time and not necessarily through formal education.[15] For this reason, the development of skills is considered to be a dynamic process, influenced not just by education attainment.

All this being said, there is no doubt that skills qualify and enable people. They may lead to individuals' success in the labor market and job mobility. Moreover, at a macroeconomic level, skills may contribute to better economic and social outcomes.

Nevertheless, possessing the skills is not enough. In order for them to have a positive impact at an individual and/or macroeconomic level, they must be deployed adequately. In other words, an effective use of the skills is a necessary condition to get the most out of the labor force and thus, attain better outcomes.

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[13] SkillScan, (2012). *Three types of skills classification*. Retrieved from: https://skillscan.com

[14] Cognition. (2010). Oxford Dictionaries. Retrieved from: www.oxforddictionaries.com

[15] Heckman, J. J., & Kautz, T. (2013). *Fostering and measuring skills: Interventions that improve character and cognition* (No. w19656). National Bureau of Economic Research.

2.2 The phenomenon of Skills mismatch

In order to ensure that skills are being put to productive use at work, the skills possessed by individuals should match the ones that are required by their current jobs. Whenever this does not occur, the phenomenon of *skill mismatch* takes place. On one hand, individuals are considered to be "over-skilled" when the skills possessed exceed the ones required by their job. This is to say, when individuals could be able to handle harder and more complex tasks than the ones that they usually handle at work. Conversely, individuals are considered to be "under-skilled" when the skills possessed are fewer or lower than the ones required by their jobs. Both cases, over-skilling and under-skilling, represent different types of skills mismatch.

As specified before, since data about qualifications is easier and cheaper to obtain, most of the academic studies focus on education/qualification mismatch rather than skills mismatch. Although these terms are considered close proxies, they possess clear differences. Particularly, the phenomenon of qualification mismatch measures the "discrepancy between the highest qualification (education level) held by a worker and the qualification required by his/her job".[16] Despite the existent differences, some authors argue that it is probable that some qualification mismatch reflect skills mismatch. However, this hypothesis does not seem to hold in every case of qualification mismatch. For instance, there are cases of people who have been categorized as over/under qualified but at the same time, adequately matched in skills. As recently shown, there exists mixed evidence and thus, no consensus on the relationship between qualification and skills mismatch.[17]

In addition, the empirical evidence suggests that the phenomenon of skills mismatch is spreading all around the world and that policy interest on this issue is

[16] Quintini, G. (2011). *Right for the Job: Over-qualified or Under-skilled?* (No. 120). OECD Publishing.

[17] Quintini G. (2016). *Are we only apparently mismatched? Reasons and consequences of apparent qualification mismatch.* Retrieved from: https://oecdskillsandwork.wordpress.com/2016/05/27/are-we-only-apparently-mismatched-reasons-and-consequences-of-apparent-qualification-mismatch/

also growing. [18] Clearly, this growing concern is triggered by its recent diffusion and also by the huge implications that this phenomenon may have. It is likely that skill mismatch affects not only individuals but also firms involved and even the economy of a country as a whole.[19]

2.3 The importance of analyzing skills mismatch

Regarding the impacts of skills mismatch, one of the principal consequences that this phenomenon has on workers is that they are likely to receive lower wages than the ones that they could receive if they were well matched. In the case of the over-skilled workers, some economists argue that they earn higher wages than their well-matched co-workers who possess fewer skills.[20] However, over skilled workers seem to suffer a wage penalty when comparing them with individuals that possess the same level of skills and are well matched with their jobs. There is mixed evidence regarding the causes and determinants of these wage differentials. Some economists transmit the idea that the wage differentials depend on several factors linked to socioeconomic aspects such as age and gender, among others (Battu et al.1999). Despite the reason and the magnitude of the wage differentials, this monetary aspect certainly affects over-skilled workers and may clearly cause dissatisfaction.

In addition, over-skilled workers may also feel not challenged enough by the daily tasks that they need to perform. Thus, augmenting their feelings of discontent. On the other hand, various researchers also found that over-skilling may be closely linked to job mobility. More precisely, these researchers argue that over-skilled workers are more likely to be promoted than well-matched workers that possess the same level of skills (Hersch, 1991; Robst 1991). Both the feelings

[18] World Economic Forum (2014) "Matching Skills and Labor Market Needs. Building Social Partnership for Better Skills and Better Jobs", Switzerland.

[19] European Centre for the Development of Vocational Training (Cedefop). (2010). *The skill matching challenge: analysing skill mismatch and policy implications*. Office for Official Publications of the European Communities, Luxembourg.

[20] McGuinness, S. (2006). Overeducation in the labour market. *Journal of economic surveys*, *20*(3).

of dissatisfaction and the higher probability of job mobility of over-skilled workers, may clearly lead to a high turnover of employees for the firm. The firm may be forced to invest in recurrent recruiting processes and constant training of the new hires. Ultimately, this phenomenon will probably have a significant effect over the firm's productivity.

Furthermore, over skilled workers tend to under use their skills. Thus, causing a waste of their abilities. This waste of human capital can also be interpreted as a waste of the resources that were initially invested for its achievement. Besides, if skills are under-used, they are prone to deteriorate or diminish over time.

On the other hand, evidence also suggests that under-skilled workers earn lower wages than the well-matched workers doing the same job. Additionally, under-skilled workers may feel forced to work extra hours or to make an extra effort in order to achieve the daily tasks required. This situation may cause stress, frustration and ultimately, lower productivity for the firm. Thus, this type of skills mismatch may also cause dissatisfaction, generate high employee turnover for the firm and ultimately, affect its level of output.[21]

Regarding the impact on the firms, they are not only affected by the high turnover of employees. Some few studies attempted to calculate the impact of under-utilization of skills or over-skilling on firm's productivity. For example, Tsang (1987) found that there exists a negative correlation between over-skilling and the firm's output. Additionally, at a macroeconomic level, it is also claimed that skills mismatch may contribute to the rise of unemployment and enhance its persistence.

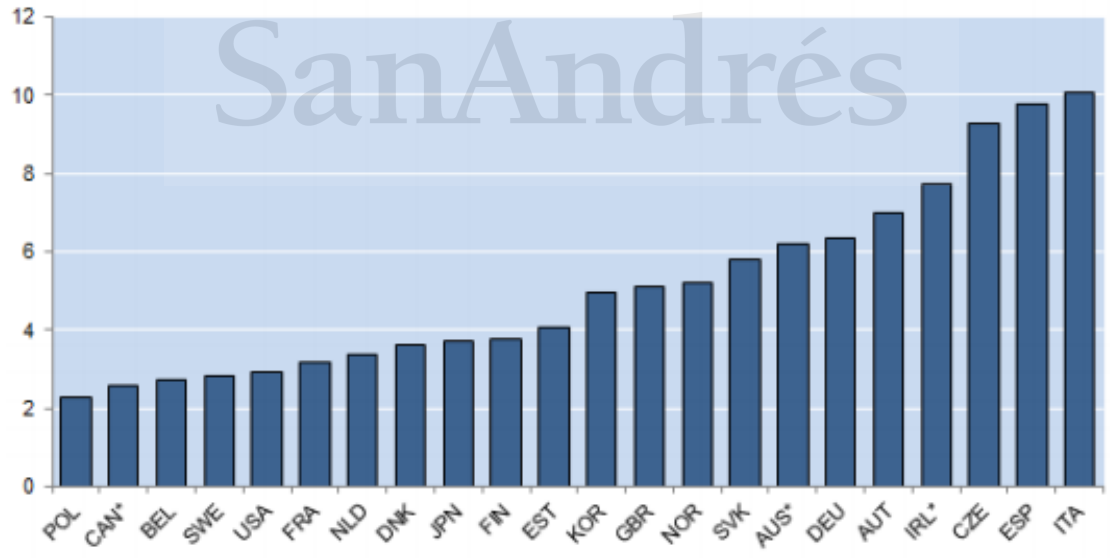
The phenomenon of skills mismatch does not only affect the individuals and the firms involved but it also seems to have an impact at a macroeconomic level. Several studies argue that a rise in the level of skills mismatch of a country negatively affects the unemployment rates. More precisely, they argue that a rise in skills mismatch would cause higher structural unemployment and would also increase its persistence (Jackman et al. 1991 and Olitsky, 2008). In the study of

[21] McGowan, M. A., & Andrews, D. (2015). Labour market mismatch and labour productivity: Evidence from PIAAC data. *OECD Economic Department Working Papers*, (1209), 0_1.

"The Procyclality of Mismatches", Olitsky finds a negative correlation between the level of over skilled workers on skilled jobs and the unemployment rates of the US. Nevertheless, the evidence regarding the impact of skills mismatch on unemployment is mixed. Definitely, both over skilling and unemployment represent a waste of human resources. For this reason, it is also argued that the presence of skills mismatch could probably obstruct the economic growth of a country.

The working paper "Skill Mismatch and Public Policies in OECD countries" written by Muge Adelat McGowsan and Dan Andrews (2015) reinforces the idea of the existence of a negative relationship between skills mismatch and the aggregate labor productivity. Specifically, they argue that there are two main channels by which aggregate productivity is affected: lower productivity of the individual firms and a lack of efficient allocation of resources across the firms. Figure 1 shown below and obtained from the same study recently mentioned, simulates the percentage by which the labor productivity of each country would be increased by a reduction in their skills mismatch to the best achievable level:

Graph 1: Simulated reduction of Skills Mismatch: Productivity gains (%)



Source: *OECD calculation based on 2012 data sets.*

According to the graph presented above, it's interesting to remark that reducing skills mismatch completely would imply a gain of approximately 10% in

aggregate productivity for Italy and Spain.

Undoubtedly, both over-skilling and under-skilling are important aspects of the labor market. At first glance, it probably seems that this phenomenon affects individuals and individual firms solely but clearly, it may have a macroeconomic impact as well. Skills mismatch may affect unemployment and even slow down the economic growth of a country. In other words, this phenomenon may end acting as a barrier to high rates of productivity and economic growth. [22]

[22] OECD and Statistics Canada (2005). *Learning a living: First Results of the Adult Literacy and Life Skills Survey*. Ottawa and Paris.

3. Theoretical Framework

There is still no unified theory universally accepted on skills mismatch. However, a large quantity of economic theories helps to shed light on the causes of this phenomenon and the labor market imperfections that are carried with it. In this section, the consistency of the principal labor market theories with education and skill mismatch will be assessed.

3.1 Human Capital Theory

One of the principal theories that will be assessed is the Human Capital Theory (Becker, 1964). This model was developed with the aim of explaining the distribution of earnings within the developed economies. Essentially, it suggests that individual's earnings are mostly determined by their human capital and not by the characteristics of the job that individuals have. Thus, it is clear that this theory principally focuses on the supply side of the economy.[23]

The idea behind this model is that the educational attainment of an individual is positively correlated with his/her income. More precisely, the model states that education increases the level of skills, leading to higher productivity and thus, to higher earnings.[24] Under neoclassical assumptions, this theory suggests that in the long run, wages will always equate to the worker's marginal product, determined by the human capital obtained through education and on the job training (Mc Guinness, 2006). Therefore, the theory predicts that equilibrium will be reached in the long run, where firms will fully utilize the skills of the labor force.

Since skills mismatch may involve the existence of skills under utilization and of wages unequal to the marginal product of an individual, the phenomenon appears to be inconsistent with the HCT; at least in the long run.

[23] Desjardins, R., & Rubenson, K. (2011). An analysis of skill mismatch using direct measures of skills. *OECD Education Working Papers*, (63), 0_1

[24] Strober, M. H. (1990). Human capital theory: Implications for HR managers. *Industrial Relations*, *29*(2), 214-239.

Nevertheless, many economists still argue that the existence of skills mismatch doesn't completely overthrow the HCT. Due to the fact that this theory allows short-term disequilibria, as long as skills mismatch is not proved to be a persistent phenomenon, the theory may still hold. The supporters of this view usually predict that skill mismatch will disappear in the long run, either because the firm will adapt its production process to fully use the skills available or because the workers will find a new job where they are well matched.[25] Under several assumptions made and in an ideal world, this may probably occur. However, in the real world, various barriers such institutional ones may prevent the full utilization of skills.

On one hand, some supporters of the HCT may even argue that these inconsistencies are just apparent and that they can be explained by the presence of skills heterogeneity. Based on this explanation, the wages of the workers in the long run, would be reflecting their real abilities and productivity. According to this view, the lower wages would be just a mere indication of lower abilities or contributions to the job.

On the other hand, some opponents of the HCT still question the consistency of this theory for several reasons. First of all, as stated above, they point out that institutional rigidities such as restrictive working policies, may prevent the firms to adapt and fully utilize the education and skills of the workers or also, may prevent the firms to pay the workers wages equal to their marginal product (Green et al., 1999). Additionally, it can also be argued that the considerable increase in the supply of graduated labor force complicates the adaptation of the production process to fully use all the skills provided.

With all these arguments being said, it is clear that there is no consensus on the consistency of the HCT with the existence of skills mismatch. However, its consistency is arguable as long as the phenomenon of skills mismatch is not proved to be a long-term issue and as long as the model does not control for abilities heterogeneity. Regarding the persistence of skills mismatch, evidence is mixed and opinions discern.

[25] Desjardins, R., & Rubenson, K. (2011). An analysis of skill mismatch using direct measures of skills. *OECD Education Working Papers*, (63), 0_1.

3.2 Technological Change Theory

The phenomenon of technological change was frequently treated as an exogenous factor in most of the economic theories. However, Technological Change Theories attempt to incorporate this phenomenon.

As mentioned before, the HCT assumes that in the long run equilibrium is reached where skills are fully utilized and thus, there exists no skills mismatch. For this reason, the HCT seems to implicitly assume that firms will adapt their technological processes in order to fully utilize the skills available. However, this will not necessarily occur for several reasons. One of the reasons could be the existence of structural barriers that discourage the adjustment of a firm's technological process.

Technological changes may affect and enhance the phenomenon of skills mismatch in different ways. First of all, technological changes together with the existence of some sort of barrier to apply them, may lead to skills underutilization. Moreover, besides from causing loss or deterioration of skills, this issue may also signify a loss of opportunities of the firm to progress.

In addition, the firms that are more vulnerable to suffer technological changes may be encouraged to hire over-skilled workers in order to anticipate any future need. Furthermore, due to the rapid implementation of technological advances, some workers may become under-skilled.[26]

3.3 Career mobility theory

The third theory that is going to be assessed in this paper is the Career Mobility Theory, developed by Sicherman and Galor (1990). The main idea transmitted by this theory is that although over-skilled workers suffer a wage penalty for their condition, they are benefitted by a higher probability to be promoted. On one hand, this theory is consistent with the fact that youths are one

[26] Desjardins, R., & Rubenson, K. (2011). An analysis of skill mismatch using direct measures of skills. *OECD Education Working Papers*, (63), 0_1

of the groups within society that is more affected by over-skilling. On the other hand, this theory does not help to explain clearly the issue of under-skilling.

In addition, it is worth mentioning that according to this theory, skills mismatch is seen as a temporary phenomenon since the actual over-skilled workers will be able to receive promotions and become well matched with their new jobs.

3.4 Job Competition Model

As mentioned before, the HCT makes clear focus on the supply side of the economy. However, there are various studies that emphasize on the demand side of the economy instead. More precisely, these studies transmit the basic idea that it is usually difficult for a firm to adjust its production process to fully use individuals' human capital (Duncan and Hoffman, 1981). The difficulty of the firm to adapt is even greater in those firms that hire heterogeneous workers. The idea stressed by this view is that if the firms are certainly not able to adapt, then individual's earnings will not just depend on the individuals' characteristics but also on the type of the job.

The Job Competition Theory, developed by Lester C. Thurrow (1975) is one of the theories that mainly focus on the demand side of the economy. In my opinion, this is an extreme theory since it suggests that the earnings depend solely on the job's characteristics.

Thurrow's theory considers a labor market where individuals compete for the jobs depending on their training costs (Mc Guinness, 2006). In this case, formal education just seems to be useful in order to obtain the job. This is to say, education would be playing a role of job allocation. Once the job is obtained, the earnings will not be determined by the surplus of education or skilling that an individual possesses but by the characteristics of the job. In this way, this theory suggests that all the workers that perform the same job will earn the same wage.

For these reasons, it is clear that this theory seems to be completely consistent with the existence of workers possessing more education and skills than

the ones required to perform their jobs.[27] Moreover, this model provides an explanation for the existence of long-term over-skilling and over-education but it also provides an explanation for the existence of over-investment in education. [28]

In conclusion, the JCT seems to be consistent with the long term presence of skills mismatch. In addition, it transmits the idea that the surplus of education or skills that an individual possesses helps to attain the job but has null remuneration.

3.5 Assignment model

The Assignment Theory (Sattinger, 1993) occupies an "intermediate" position between the two extreme models previously mentioned (The HCT and the JCT). In this particular theory, both the workers' and the jobs' characteristics are determinants of the earnings.

The principal idea transmitted by this model is that the education and skills of the workers are not the only factors that enhance their productivity. Additionally, their productivity also depends on the level of complexity of the job that they possess. Just as Quintini (2011) explains, individuals working on a job that requires less skills than the ones that they possess, will probably have a "productivity ceiling" lower than the one that they could have if their skills were fully utilized. Consequently, earning lower wages. On the other hand, when individuals are better matched with their jobs, the theory predicts that they will have a productivity ceiling higher enough to motivate them and enhance their productivity. Therefore, leading to higher wages. In this last case, their productivity will be limited by their abilities and not by the job.

This theory ultimately suggests that productivity will be maximized when workers are allocated to the jobs according to their skills. Moreover, according to this "intermediate" theory, both the supply and the demand sides of the economy

[27] Farooq, S. (2011). Mismatch between education and occupation: a case study of Pakistani graduates. *The Pakistan Development Review*, 531-552.

[28] Quintini, G. (2011). Over-qualified or under-skilled: A review of existing literature. *OECD Social, Employment, and Migration Working Papers*, (121), 0_1.

are factors that determine the wages of the workers. The earnings are the result of an allocation problem.

In conclusion, this theory is consistent with the existence of skills mismatch since it allows its presence and its persistence as well.

Very few studies tried to empirically assess the consistency of these theories with qualification/skill mismatch (Duncan and Hoffman, 1981). In most of the cases, the assignment theory was considered to be the most consistent theory. However, it must be taken into account that the majority of these studies, measured qualification mismatch. [29]

[29] Quintini, G. (2011). Over-qualified or under-skilled: A review of existing literature. *OECD Social, Employment, and Migration Working Papers*, (121), 0_1.

4. Methodological framework: skill mismatch measures

There is no universally accepted measure of skills mismatch. However, two main approaches exist in order to measure this phenomenon: the self-report approach and the direct or objective approach. [30]

4.1 Direct approach

Ideally, this phenomenon could be calculated by comparing objective measures of workers' skills and objective measures of the skills required by their jobs. However, objective data about skills at an individual level is not easy to gather and usually unavailable. [31] For this reason and as mentioned at the beginning of this study, researchers tend to analyze the phenomenon of education mismatch instead of skills mismatch. Clearly, information about the educational attainment of individuals is easier to obtain. Furthermore, various cross-country data sets are already available with relevant information about this topic.

Regarding this approach, there are several assessments that attempt to calculate objectively the skills of workers. However, they are very limited and as recently pointed out, there is no universally measure of skills yet accepted. For example, the *Programme for the International Assessment of Adult Competencies* (PIAAC) is an international survey of Adult Skills conducted by the OECD that offers a new way of measuring skills and thus, calculating skills mismatch. This international survey measures key cognitive skills (literacy, numeracy and problem solving) needed for individuals and economies to prosper. In addition, it measures social, physical and learning skills. [32] It also contains a background assessment which collects information about demographic characteristics, salary paid at work, participation in trainings and a short self report that assesses the

[30] Perry, A., Wiederhold, S., & Ackermann-Piek, D. (2014). How can skill mismatch be measured? new approaches with piaac. *Methods, data, analyses*, *8*(2).

[31] OECD (2011), *OECD Employment Outlook 2011*, OECD Publishing, Paris.

[32] OECD Better Policies for Better Lives. (n.d.) *Survey of Adult Skills (PIAAC).* Retrieved from: http://www.oecd.org/skills/piaac/

existence of skills mismatch. Since this survey was constructed with the aim of implementing it internationally, data derived from it can be used to compare the workforce of different countries and to develop better economic/educational policies to enhance needed skills, among other uses.

The PIAAC has clearly opened new doors and provided new approaches to measure the phenomenon of skills mismatch.[33] Unfortunately, this survey is conducted in approximately 40 countries but not in Argentina. Moreover, replicating this test would be a very difficult task because extensive assessments are involved.

Other authors have also intended to measure the phenomenon of skills mismatch using a similar but more limited method: comparing the level of *certain* skills possessed by the workers and the ones required by their jobs. The most common skills that are compared are literacy and numeracy, among others. For example, Krahn and Lowe (1998) compared the literacy levels of individuals with the frequency with which literacy tasks were performed in their jobs. The literacy data was measured through the implementation of several reading, writing and numerical tests and was extracted from the International Adult Literacy Survey. Although this method may provide information about some specific skills gap, one of the main disadvantages is that it provides a partial view of the phenomenon of skills mismatch.[34]It just analyzes one set of skills and this may not be relevant enough.

4.2: Self-report approach

On the other hand, most of the authors that study the phenomenon of skills mismatch tend to use self-reports in order to obtain information about it. The most common approach is to directly ask the workers to what extent they use the skills they possess at work. Different self-reports were used with the objective of analyzing skills mismatch in Australia, Portugal and Great Britain, among other

[33] Perry, A., Wiederhold, S., & Ackermann-Piek, D. (2014). How can skill mismatch be measured? new approaches with piaac. *Methods, data, analyses*, *8*(2).

[34] Quintini, G. (2011). Over-qualified or under-skilled: A review of existing literature. *OECD Social, Employment, and Migration Working Papers*, (121), 0_1.

countries.

For example, Green and McIntosh (2007) analyzed the phenomenon of skills mismatch in Great Britain using data extracted from the Skills Survey of 2001. Basically, they classified an individual as over-skilled if they strongly disagreed or simply disagreed to the following statement:

- "In my current job I have enough opportunity to use the knowledge and skills that I have"

Conversely, they classified the individual as under skilled if they strongly agreed with the following statement:

- "I would perform better in my current job if I possessed additional knowledge and skills".

Using this self-report method, the researches reached to the conclusion that 35% of the population of Great Britain was over-skilled while 13% under-skilled in 2001.[35]

In addition, the European Working Condition Survey (2005) included three questions with the aim of assessing the existence of skills mismatch. These questions were also used in the OECD report of 2011[36]. The self-report contains the following three statements:

(a) I need further training to cope well with my duties.

(b) My duties correspond well with my present skills.

(c) I have the skills to cope with more demanding duties.

In this case, the individual had to choose just one answer. If the first answer was chosen, the individual was considered under-skilled. If the second answer was chosen, the individual was considered well matched. Finally, if the third answer was chosen, the individual was considered to be possibly over-skilled.

Last but not least, as already mentioned before, the PIAAC also includes a

[35] Quintini, G. (2011). Over-qualified or under-skilled: A review of existing literature. *OECD Social, Employment, and Migration Working Papers*, (121), 0_1.

[36] *OECD (2011), Education at a Glance 2011: OECD Indicators, OECD Publishing.*

self-report questionnaire in order to assess skills-mismatch. The following questions are the ones asked:

- Do you feel that you have the skills to cope with more demanding duties than those you are required to perform in your current job?

- Do you feel that you need further training in order to cope well with your present duties?

These questions must be answered with a "yes" or a "no" and the combination of both answers leads to four possible outcomes. If both questions are answered with "No", the individual is considered to be *well matched.* If the first answer is "No" and the second one is "Yes" the individual is considered to be *under-skilled*. If the opposite happens, the individual is considered to be *over-skilled*. Finally, if both answers are "Yes", the individual is considered to be *over-skilled as well as under-skilled*. This last classification does not seem to be very clear but it has been argued that it could be making reference to difference set of skills.[37] This is to say, an individual may be over-skilled regarding a certain set of skills but also under-skilled regarding another set of skills.

The self-report method possesses several advantages and disadvantages. First of all, it's worth mentioning as an advantage that people are usually considered to be the best-qualified witnesses of their own personalities, including the skills that they posses. In other words, people possess more information about themselves than anybody else, especially when talking about soft skills that are not easily measurable.[38] In addition, the self-reports can be easily implemented by carrying out surveys to workers. This is to say, the implementation of this method is practical, cheap and up to date information can be easily obtained. [39]

The main disadvantage of the self-report method is that the information

[37] Perry, A., Wiederhold, S., & Ackermann-Piek, D. (2014). How can skill mismatch be measured? new approaches with piaac. *Methods, data, analyses*, *8*(2).

[38] Robins, R. W., Fraley, R. C., & Krueger, R. F. (Eds.). (2009). *Handbook of research methods in personality psychology*. Guilford Press.

[39] Perry, A., Wiederhold, S., & Ackermann-Piek, D. (2014). How can skill mismatch be measured? new approaches with piaac. *Mthods, data, analyses*, *8*(2).

obtained is likely to suffer from some bias. For example, workers may inflate the skills that they use at work. Nevertheless, it is believed that valuable information can be obtained regarding workers and jobs' skills. [40]

[40] OECD (2011), *OECD Employment Outlook 2011*, OECD Publishing, Paris.

5. The causes and socioeconomic determinants of skills mismatch

5.1 Causes of skills mismatch

It is interesting to highlight the fact that most of the studies of skills mismatch have focused on its implications rather than on its causes and determinants. Besides the formal economic theories that were already assessed, other factors may also explain the emergence of skills mismatch. For a better understanding of this phenomenon, in this section we will try to shed light on other causes and the main socioeconomic factors that seem to determine the likelihood of skills mismatch.

Usually, it is argued that some skills mismatch is inevitable. Due to the existence of asymmetric information in labor markets and lack of transparency, young people who are recently graduated and are at the beginning of their professional career, may take jobs and later realize that they don't reach their expectations. The same may happen with unemployed people getting new jobs. In addition, once people gather job experience, this may help certify some of their skills and allow them to obtain jobs that are a better match for them.

Additionally, skills mismatch may also be voluntary during some time. For example, young people who are still studying and don't have enough time or flexibility, may be part of voluntary skills mismatch until they graduate. Although they may not be perfectly matched with their current jobs while being students, they may need the money and/or the experience. Furthermore, people who are caring for family members or women that care for their small children may also contribute to this voluntary type of mismatch for the same reasons. They probably prioritize the flexibility provided by their jobs although they might be under-skilled workers. Nevertheless, it has been argued that this particular type of mismatch, while temporary, could have positive implications.

The labor markets nowadays are undoubtedly far more complex than the ones described by the economic theories mentioned before. In addition, as already exposed in the previous section, the phenomenon of skills mismatch may be caused either by a supply side factor or a demand side factor.

As regards the causes linked to the demand side of the skills, wage rigidities and delays in the adjustment of the production processes are two examples. On the other hand, delays in the adjustments of the education system can be considered a possible cause linked to the skill supply side. Moreover, another cause already mentioned in this paper is the existence of asymmetric information. This cause could be categorized either as a supply side or a demand side cause.

5.2 Socioeconomic determinants of skills mismatch

There are several studies that point out that the likelihood of skills mismatch is related to several socioeconomic factors.

It is worth mentioning that there's a study written by Quintini (2011), which calculates the marginal effects of some factors on the probability of being mismatched.[41] More specifically, the author uses probit models to assess the significance of certain factors on the likelihood of skills mismatch and qualification mismatch. It's important to highlight the fact that only some European countries are taken into account in this empirical model. [42]

According to the results, women are more likely to be under-skilled and skilled than men. One of the reasons that could explain this result is the presence of discrimination in the labor market (Desjardins & Rubenson, 2011). In addition, women may search and accept less demanding jobs in order to take care of their children[43]. Thus, contributing to their higher likelihood of being under-skilled. Moreover, it is also argued that due to the higher fixed costs of employment and higher quit rates, women are asked for more working experience than men during

[41] Quintini, G. (2011). Over-qualified or under-skilled: A review of existing literature. *OECD Social, Employment, and Migration Working Papers*, (121), 0_1.

[42] The study includes: Austria, Belgium, the Czech Republic, Denmark, Germany, Greece, Estonia, Finland, France, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

[43] OECD (2013). *OECD Skills Outlook: First results from the Survey of Adult Skills*. Paris, France: OECD Publishing.

the selection process.[44] This fact may clearly contribute to the higher probability of women of being under skilled. Furthermore, Quintini (2011) suggests that women are less prone to self-report being under or over skilled than men.

Additionally, consistent with other empirical findings, immigrants (independently of their nationality) are more likely to be both over qualified and over skilled. In my opinion, there are several reasons that may explain this issue. On one hand, immigrants may probably not speak perfectly the language of the country they are currently living in. In addition, racial discrimination may also contribute to the major probability of being mismatched and lastly, in some cases, immigrants may have acquired proficiency certificates in their own countries that are not recognized worldwide and thus, not recognized when they apply for a job. Among several studies that focus on this issue, Sandra Nieto, Alessia Matano and Raul Ramos (2013) carry out an econometric model in order to corroborate if there exists a difference in the probability of being over skilled between natives and immigrants living in Europe. The results clearly show that immigrants are more prone to be over skilled than natives. The difference between the two groups of individuals is of 44.4 percentage points. However, it is also interesting to highlight another interesting finding of this study: the more years that an immigrant stays in the host country actually reduces the probability of being over skilled. More specifically, every additional year of residence in the host country reduces the probability of the immigrant of being over skilled by 2.8 percentage points. Moreover, the authors introduce some dummy variables to this same econometric model and reach to the result that immigrants coming from non-EU countries are more likely to be over skilled than immigrants coming from EU countries. All these findings reinforce the idea that there's an imperfect transfer of human capital that was acquired at the origin country. The fact that an additional year of residence of the immigrant reduces the probability of being over skilled conveys the idea that an "adaptation process" exists for the immigrant. [45]

[44] European Centre for the Development of Vocational Training (Cedefop). (2010). *The skill matching challenge: analysing skill mismatch and policy implications*. Office for Official Publications of the European Communities, Luxembourg.

[45] Nieto, S., Matano, A., Ramos, R. (2013). *Skill mismatches in the EU: Immigrants vs. Natives*. Barcelona, Spaign: Research Institute of Applied Economics.

Moreover, over qualification and over skilling seem to decrease with years of experience. Several studies reach to the result that young people are significantly more over skilled than older people (Allen et al., 2013; McGowan and Andrews, 2015). Recently graduated students are more prone to take temporary or "entry level" jobs that may result in over skilling. Moreover, information and search costs may also contribute to the higher probability of being over skilled. In addition, as workers gain experience, they are able to signal their skills by making reference to the tasks performed at their previous jobs.[46] This argument is consistent with a study held by the OECD. In this study, a probit model is also used and it shows that both over-skilling and under-skilling decrease with working experience. This result suggests that there's a type of "adjustment process" that takes place over time and reduces skills mismatch. [47]

Furthermore, over skilling seems to decrease with firm size. This outcome may be explained by the fact that workers of large firms probably have a greater quantity and variety of job opportunities than workers of small firms. In addition, larger firms are usually less financially concerned and are able to invest more in recruiting activities that help reduce the incidence of skills mismatch.[48]

In addition, although it is frequently argued that over skilling is more probable among workers with temporary contracts, Quintini's model doesn't obtain significant coefficients that prove this idea. In the same way, although marital status is usually claimed to be a factor that determines a greater likelihood of under skilling, no significant coefficient was obtained for this variable either.

5.3 Labor market determinants of skills mismatch

Besides the socioeconomic factors just mentioned, Quintini (2011) also empirically tests the impact of some labor market factors on the likelihood of being

[46] Desjardins, R., & Rubenson, K. (2011). An analysis of skill mismatch using direct measures of skills. *OECD Education Working Papers*, (63), 0_1.

[47] OECD (2011), *OECD Employment Outlook 2011*, OECD Publishing, Paris.

[48] McGowan, M. A., & Andrews, D. (2015). *Skill mismatch and public policy in OECD countries*. OECD Working Paper

mismatched. More specifically, this author tests the effect of different types of job separations on the likelihood of qualification and skills mismatch.

Usually, one may think that being fired from a job may lead to over-skilling in future jobs. The idea behind this deduction is that when individuals involuntarily loose their job, they may be forced to accept jobs that require fewer skills than the ones that they possess because if not, they may suffer a cut in their unemployment benefits. [49] On the other hand, the involuntary loss of a job may also transmit a negative signal to the employers who are looking for new hires. Thus, individuals may be offered and accept jobs that require lower skills than the ones that they actually have.

The results reached by Quintini's probit model are coherent with the just specified point of view. Individuals who have involuntarily lost their jobs are more likely to be over-qualified and over-skilled in the future than individuals who have left their jobs voluntarily. Consistent with this finding, the OECD study (2011) also reached to the result that over skilling is more probable on those workers who have been fired. [50]In addition, individuals who have left their jobs voluntarily are more likely to be under-qualified in their future jobs.

Additionally, Quintini (2011) reaches to another interesting result: the way individuals find their job may also affect the likelihood of being mismatched. More specifically, jobs obtained through family's recommendations and relying on vocational agencies increase the likelihood of being over-skilled. Once again, the OECD results (2011) agree with this finding: families and friends recommendations don't usually help to find well-matched jobs, when comparing these applications to direct applications.

[49] Quintini, G. (2011), "Over-Qualified or Under-Skilled: A Review of Existing Literature", OECD Social, Employment and Migration Working Papers, No. 121, OECD Publishing.

[50] OECD (2011), *OECD Employment Outlook 2011*, OECD Publishing, Paris.

6. Skills mismatch and the automotive industry

Today's automotive industry requires highly skilled and flexible workers.[51] It is crucial that workers of this industry adapt to the technological advances that frequently take place. This is to say, skills and flexibility are essential to reach the demanding international standards.

According to the PriceWaterhouseCoopers' 18th Annual Global CEO Survey carried out last year, 76% of the CEOs of Automobile industries were worried about the availability of skills, compared to a 60% obtained in the survey of the previous year More specifically, only 3% of the automobile industry CEOs were not concerned at all, 19% were not very concerned, 48% were somewhat concerned and 28% were extremely concerned.

It is interesting to mention the fact that, for example, Toyota Motor Sales (TMS), USA, faced a shortage of 60,000 technicians in 2011. In order to close this gap, a non-profit facility named Los Angeles Urban League Automotive Training Center (ATC) was established by TMS and the Los Angeles Urban League with the objective of creating a talent pool not only for TMS but also for the whole automotive industry. [52] The fact that TMS has invested more than $7 millions in ATC from 1993 to 2001 suggests the importance that represents the closure of this gap.

In addition, in order to address the skills gap of the UK's automotive industry, the Automotive Industrial Partnership (AIP) was established in 2014 by bringing together the government of UK and several industry leaders such as Bentley, BMW, GKN, Honda, Jaguar Land Rover, Nissan, Toyota and Vauxhall. The mission of the AIP is basically to allow the employers to attract and develop the

[51] Cunneo, D. and Dziczek K. (2013). *The Auto Industry: In Search of Talent amid Changing Skills Requirements. Retrieved from:* http://www.areadevelopment.com/Automotive/2013-Auto-Aero-Site-Guide/auto-sector-skilled-workforce-needs-29292741.shtml

[52] Jasinowski J. (2001). *The Skills Gap 2001: Manufacturers Confront Persistent Skill Shortages in an Uncertain Economy*. National Association of Manufacturers, Andersen.

current and future workforce that the automobile sector needs and will need in order to compete globally.[53]

All the facts recently mentioned transmit the importance of closing the skills gap in the automotive industry, globally speaking.

In Argentina, the automotive and auto-parts industry represents a 9% of the gross industrial product. It is interesting to highlight the fact that during the period of 2003-2012 the production of this industry grew at an average annual rate of 18%. Thus, this industry is not only a very important sector of the country's economy but also a dynamic one.

Just as mentioned before, studies that analyze the phenomenon of skills mismatch in Argentina are undoubtedly scarce. Consequently, studies that analyze the phenomenon of skills mismatch in the automotive industry of this country are scarcer or even inexistent.

It is interesting to focus the study of skills mismatch in the automotive industry of the country for several reasons: this industry is not only one of the most significant sectors of Argentina's economy but additionally, its work force encompasses a high level and large variety of skills needed for the numerous stages of the production process. In addition, focusing the study in just one industry may allow controlling a large variety of variables.

[53] Auomotive Industrial Partnership. (n.d.). Retrieved from: http://www.automotiveip.co.uk/

7. Previous Literature and Argentina's Labor market

7.1 Argentina's labor market

Before analyzing skills mismatch in a specific industry of Argentina, the labor market and the studies about education and skills mismatch in this country will be shortly described in this section.

Argentina is considered to be a middle-income country and its labor market is characterized by heterogeneity and a high rate of informal employment, although it has diminished over time.[54] This country has suffered various fluctuations from the 80's until now. Some of these fluctuations were caused by the introduction of new reforms and others were principally triggered by the economic situation of the country. Next, a brief description of the evolution of Argentina's labor market will be presented.

In 1991, a Law of Convertibility was adopted. This law established an exchange rate pegged to the dollar. As expected, this plan was successful reducing the inflation. However, although the first years of the 90's witnessed some positive economic features, the economy of the country was vulnerable to external shocks due to the pegged exchange rate. In the mid-nineties various negative economic features already present in the last years of the previous decade, were deepened. Some examples of these deepened features were labor instability and income inequality, among others. In addition, the structural reforms that were promoted at that time, also affected the creation of employment. Yet, the principal characteristic that described this decade was the high level of unemployment. The average rate of unemployment was 15% from 1993 to 2002 with peaks of 18% and 20% in 1995 and 2002, respectively. [55]

At that time, the less qualified people were the ones that were more affected by this increasing unemployment, income inequality and instability. In fact, a

[54] Bertranou, F., Casanova, L., Jiménez, M., & Jiménez, M. (2013*). Informality and Employment Quality in Argentina*. Country Case Study on Labor Market Segmentation.

[55] Beccaria, L. (2004). *La Sobreeducación en la Provincia de Buenos Aires: Un análisis exploratorio*. Argentina: Instituto de Ciencias. Universidad Nacional de General Sarmiento.

recession started to take place in 1998 and even intensified these issues. In this context, less qualified people were vulnerable: very few of them were employed, and those who had a job usually suffered of reduced working hours, low earnings, very poor social protection and high employment and income instability. From 1999 to 2002, when the Convertibility plan collapsed, the Gross Domestic Product was reduced by 18.4%. [56]

Undoubtedly, the economic, political and social crisis that took place in 2001 left serious scars in the labor force of the country such as unemployment, income inequality and poverty, among others. For this reason, one of the main challenges of Argentina nowadays is to build a skilled labor force that will enable the country to achieve sustainable economic growth. [57]

Regarding the actual quality of the labor force, it is important to highlight the fact that Argentina was one of the first countries in Latin America to achieve the highest educational coverage in primary level and a high coverage in secondary education as well.[58] In addition, Argentina possesses high schooling rates in primary education. However, this country has been showing a low average performance in international education assessments when compared to the other Latin American countries assessed. This is alarming because a positive relationship seems to exist between labor productivity and quality of education.[59]

The Programme for International Student Assessment (PISA) is an international survey that evaluates the skills and knowledge of students of 15 years old. The most recent surveys were held in 2009 and 2012 in 65 different countries and principally evaluated the competencies of students in mathematics,

[56] Bertranou, F., Casanova, L., Jiménez, M., & Jiménez, M. (2013*). Informality and Employment Quality in Argentina*. Country Case Study on Labor Market Segmentation

[57] World Bank (2006). *Argentina Building a Skilled Labor Force for Sustained and Equitable Economic Growth*. Report No. 31850-AR.

[58] Auguste, Echart & Franchetti. (2008). *The Quality of Education in Argentina*. An IDB Project.

[59] Hanushek, E. A., & Woessmann, L. (2010). *The High Cost of Low Educational Performance: The Long-Run Economic Impact of Improving PISA Outcomes*. OECD Publishing. 2, rue Andre Pascal, F-75775 Paris Cedex 16, France.

reading and science. Regarding Latin American countries, seven of them were assessed by PISA and Argentina was one of them.

In the latest PISA results, Latin American countries obtained low results in comparison with all the other countries that were assessed. Nevertheless, it is important to note that most of the other participating countries were developed ones, with higher GDP per capita and higher investment per student.[60]

When comparing the performances of Latin American countries in the most recent surveys, it can be seen that Chile, Uruguay and Mexico had the highest results of the region. On the other hand, Argentina's results were lower but similar to the ones of Brazil and Colombia. Last, although Peru experienced an improvement between 2009 and 2012, this country possessed the lowest average performance in both years. Finally, it is also worth mentioning that Argentina's performance average increased between 2009 and 2012. Table 1 shows the average performances in the most recent PISA:

Table 1: Average performances in PISA 2009 and 2012

	PISA 2009	PISA 2012
Argentina	395,6	396,6
Brazil	401	402
Chile	439	436,6
Colombia	398,6	392,6
Mexico	420	417,3
Peru	368	375
Uruguay	426,6	412
OECD Average	496,6	497

***Source**: Author's elaboration based on OECD data.*

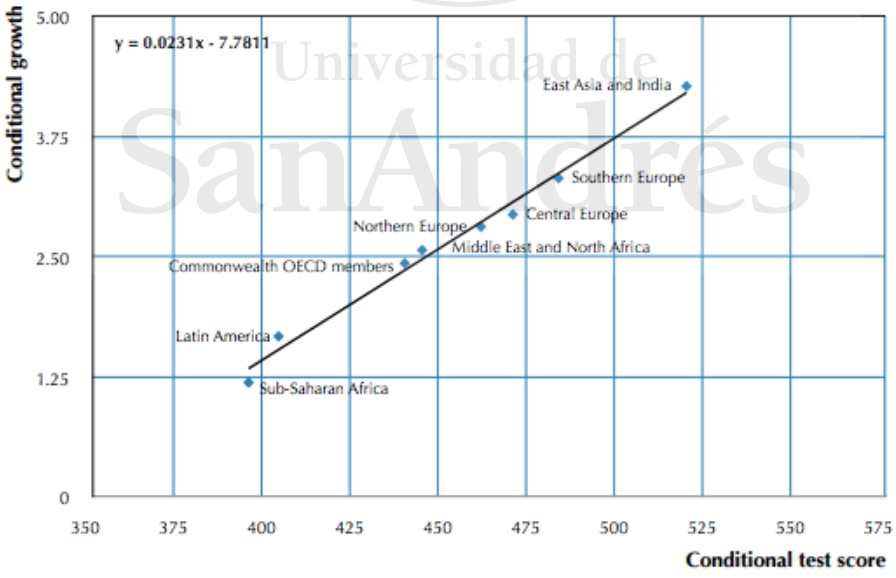
As specified before, it is important to highlight the fact that these surveys and thus, Table 1 don't include every Latin American country. For this reason,

[60] Rivas, A. (2015). *Latin America after PISA: Lessons Learned about Education in Seven Countries. Executive Summary*. Buenos Aires: CIPPEC-Natura-Instituto Natura.

although Peru is listed as the worst performance, this doesn't mean its students actually possess the lowest level of competencies in Latin America. In addition, it is important to point out the high difference that exists between the OECD countries' average performances and the Latin American performances. More specifically, Argentina was ranked 57th out of 65 participating countries.

As mentioned before, it is interesting to reinforce the idea that a correlation seems to exist between economic growth and the quality of the labor force. Graph 2, extracted from an OECD study (2010)[61], shows a regression of the average annual rate of growth of real GDP per capita between 1960 and 2000 against average test scores on cognitive skills derived from international assessments, conditional on initial income level. The conclusion that can be derived from this study is that conditional on initial income levels, the economic growth of various countries is correlated with the differences in the levels of cognitive skills that the labor force possess. This result clearly demonstrates the macroeconomic relevance of the PISA outcomes.

Graph 2: Cognitive skills and economic growth

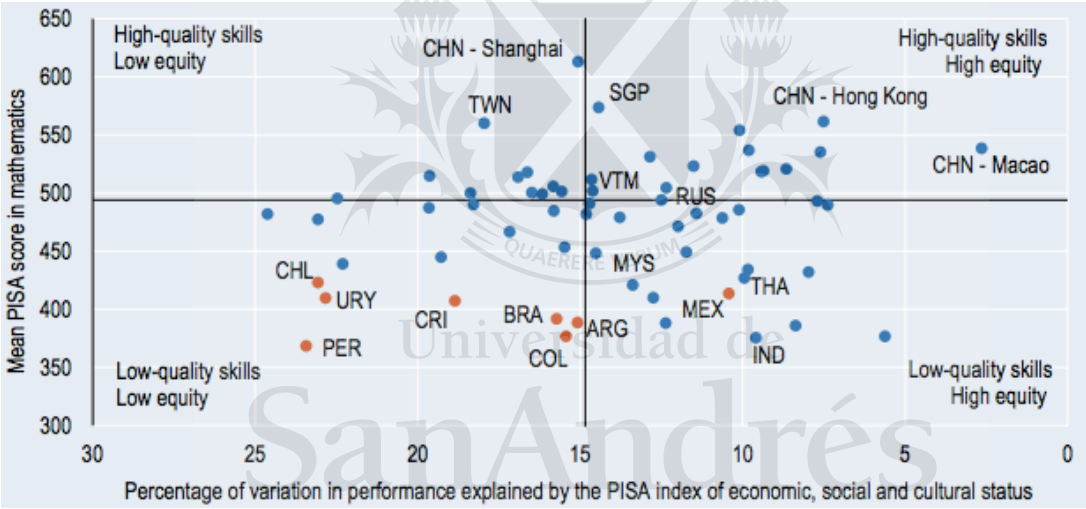


Source: *OECD (2010) "The High Cost of Low Educational Performance: The long-run economic impact of improving PISA outcomes".*

[61] Hanushek, E. A., & Woessmann, L. (2010). *The High Cost of Low Educational Performance: The Long-Run Economic Impact of Improving PISA Outcomes*. OECD Publishing. 2, rue Andre Pascal, F-75775 Paris Cedex 16, France.

Moreover, it is also interesting to point out that PISA average results may hide dispersion. Particularly, this is more likely to happen in Latin American countries: in these countries, not all the people have the same opportunities to receive high quality education. This is to say, people have unequal access to it.[62] As it can be seen on Graph 3 extracted from an OECD report (2013), most of the Latin American countries have low mean PISA scores in mathematics and high percentage of variation of performance explained by the PISA index of economic, social and cultural status. This means that individual PISA outcomes of Latin American countries depend on some extent on economic, social and cultural factors.

Graph 3: Skills' Quality and Equity



Source: *OECD (2013a), PISA 2012 Results: Excellence Through Equity (Volume II): Giving Every Student the Chance to Succeed, PISA, OECD Publishing, Paris.*

According to household surveys carried out in 2012-13, less than half of the population of Argentina, Brazil, Colombia, Paraguay and Peru believed that all the children have the opportunity to learn. In contrast, 80% of the population of OECD countries believes so.[63]

[62] OECD. (2016). *Better Policies Series: Promoting Productivity for Inclusive Growth in Latin America.* OECD publishing.

[63] OECD. (2015). *Latin American Outlook 2015: Education, Skills and Innovation for Development*. OECD Publishing.

Just as described at the beginning of this study, the quality of the labor force and also, equal opportunities are important. However, it's also fundamental that the skills of the labor force are well matched with their jobs.

7.2 Previous literature about skills mismatch in Argentina

There are several surveys and studies that attempt to estimate the phenomenon of skills mismatch in developed countries. Moreover, even data sets have been constructed for these countries in order to facilitate the calculation of this phenomenon. For example, the already mentioned Survey of Adults Skills (PIAAC) is an international assessment that provides a direct way of measuring the skills of a country's labor force and allows a comparative analysis of skills between countries. However, the PIAAC is conducted in just 40 countries and most of them are developed ones.

Since there is more data available, numerous studies attempt to assess the extent of skills mismatch in developed countries. Most of these studies reach to the conclusion that there is a large proportion of over educated people and that this seems to be a growing trend in the last years (Dolton and Vignoles, 1997, Groot and Maasen van den Brink, 2000 and Frenette, 2004).

However, as specified before, limited data exists to estimate the extent of educational mismatch in Argentina and even less data exists to estimate skills mismatch in this country. For this reason, most of the studies held were based on educational mismatch. Roxana Maurizio (2001) wrote one of the first empirical studies that intended to calculate the extent of educational mismatch in Argentina.[64] Particularly, this study aimed to estimate the magnitude of over education in Buenos Aires during the period 1992-1999. By using data of educational attainment from a national survey[65] and estimating the requirements of each job position, the author reached to the conclusion that a significant percentage of the population at that time, was over educated. In addition, it was

[64] Maurizio, R. (2001). *Demanda de trabajo, sobreeducación y distribución del ingreso*, Buenos Aires, Argentina.

[65] Known as "Encuesta Permanente de Hogares".

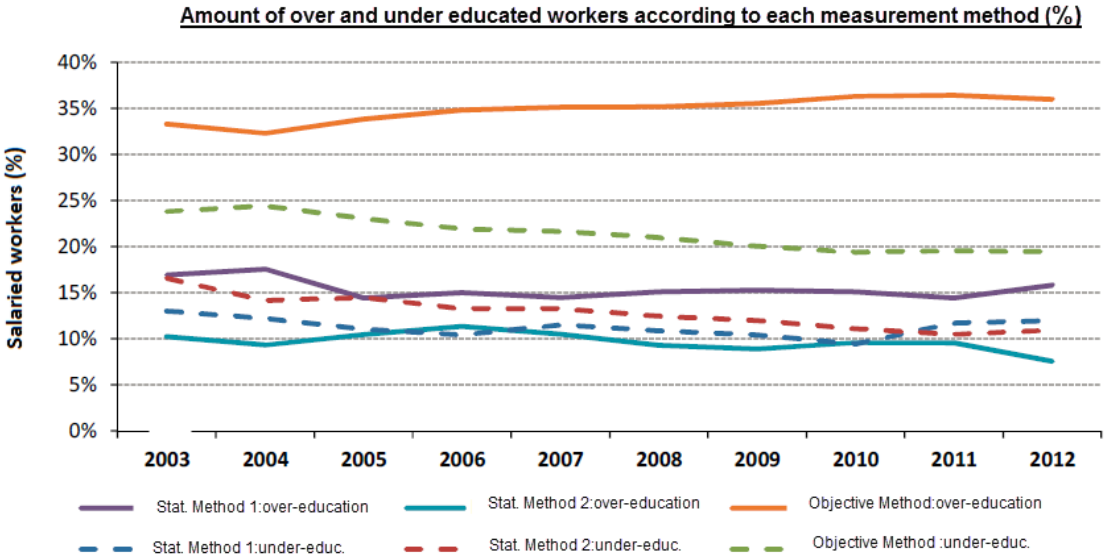
also observed that the over-educated people obtained a lower remuneration than those individuals that possessed the same level of education but had a job that required more skills.

Maribel Jimenez (2014), on the other hand, studies the relationship between skills mismatch and the informal employment in our country during the period 2002-2012. [66] More specifically, she calculates the level of educational mismatch (instead of skills mismatch) using two different statistic methods and one objective method. In addition, she uses INDEC data about education in order to obtain the percentage of over and under educated workers. This author obtains very similar levels of over and under educated employees when using the statistic methods. On the other hand, the results obtained from the objective method are slightly different. According to the objective method, during the period 2002-2012 approximately 34% of the salaried employees were found to be over-educated. On the other hand, the under-educated salaried employees represented an average of 21,5% of the total population employed. According to the other two statistical measures, approximately 15% and 10% of the total salaried population were found to be over-educated. Additionally, the under educated employees represented a 17% of the salaried population.

Additionally, using the data obtained by the implementation of these methods, the author constructed an interesting graph that shows the percentage of employees over and under educated from 2003 to 2012, according to each method used.

[66] Jimenez, M. (2014). *Desbalance de calificaciones, polarización en la creación de empleo e informalidad. Evidencia para la Argentina.* Jujuy, Argentina. Universidad Nacional de Jujuy y Red SIMEL.

Graph 4: Over and under education in Argentina (2003-2012)



Source: *Jimenez, Maribel. "Qualification Mismatch, polarization in jobs creation and informality. Evidence for Argentina" National University of Jujuy and Red SIMEL. (2014)*

Significant differences exist between the outcomes of each method of measurement. One of the main ideas transmitted by this graph is that in all the cases, the rates of over and under education seem to stay stable from 2003 to 2012. Moreover, the objective method and the statistical method 1, transmit the idea that the percentage of over-educated workers is greater than the percentage of under-educated workers in every studied year. On the other hand, according to the statistical method 2, the percentage of under educated workers is greater than the percentage of over educated workers in every year studied. Although there are differences between the results obtained from each type of measurement, the author argues that these differences were expected.

Still, an important fact must be kept in mind: the author focuses on the calculation of educational mismatch, not skills mismatch.

Additionally, Beccaria (2006) studies the phenomenon of over-education in the province of Buenos Aires.[67] The main difference between this study and the one previously mentioned is that in this case, data is obtained directly from 48 different firms based in Buenos Aires. In addition, this study focuses on the

[67] Beccaria, L. (2006). *La Sobreeducación en la Provincia de Buenos Aires: Un análisis exploratorio*. Argentina. Instituto de Ciencias. Universidad Nacional de General Sarmiento.

mismatch between the qualifications demanded by the firms (instead of focusing on the qualifications that the workers actually possess) and the ones that are really needed to perform the jobs. Regarding the collection of data and the method used to calculate the over education, the authors first selected some job positions from each firm. Afterwards, they obtained information about the tasks performed by the employees and last, they examined the requirements that the firms imposed in the recruiting processes of those specific job positions. For example, some of the requirements involved educational attainment, age and/or previous professional experiences. Once all the necessary information was acquired, they compared the complexity of the tasks performed in each job position with the qualifications requested for each job position.

One of the main results obtained by this study was that 24 out of 120 job positions were demanding over educated people. This would imply a 20 % of over educated employees.

Table 2: Amount of over educated people according to the qualifications required by their jobs (low, intermediate, technical or professional).

	Over-educated	Not over-educated	Total
Jobs of low qualifications	15	29	44
Jobs of intermediate qualifications	6	51	57
Jobs of technical qualifications	3	7	10
Jobs of professional qualifications	-	9	9
Total	**24**	**96**	**120**

Source: *Author's elaboration based on Beccaria's study.*

As it can be observed in Table 2, it was also found that the largest proportion of over-educated people belonged to those job positions that require the lowest level of qualifications.

Regarding the phenomenon of under-education, it wasn't studied nor calculated. Thus, an important fact to highlight about this study is that it only examines the phenomenon of over-education, not over skilling, in the year 2006. This is to say, up to date data regarding skills mismatch is really scarce.

8. Pilot Self-report and Results

Due to the fact that there is scarce information about skills in Argentina, the self-report method will be used in this study with the objective of demonstrating how skills mismatch could be measured in Argentina's automotive industry. In other words, a pilot survey will be performed as a small illustration of what can be done at a larger scale, with more available time and resources. In this study, we will particularly focus on the known automotive firm Mercedes Benz.

The principal multinational firms that conform the automotive industry in Argentina are Mercedes Benz, Toyota, Fiat, Ford, General Motors, PSA Peugeot-Citroen, Renault, Scania and Volkswagen.[68] The production sites of these firms are located in the provinces of Buenos Aires, Cordoba, Santa Fe and Tucuman. Among the firms that are located in Buenos Aires and thus, that are within our reach to perform surveys (General Motors, Mercedes Benz, Ford, Honda, Toyota and Volkswagen), Mercedes Benz is one of the most prestigious firm, nationally and internationally. Due to the relevance of the automotive industry in Argentina and the relevance of Mercedes Benz in Buenos Aires, I believe that a survey performed in this firm could contribute valuable information.

It is important to note that the focus of this study will not allow us to generalize upon it. Moreover, since it is just a pilot survey and limited amount of workers will answer it, the results obtained may not be absolutely significant. In addition, the self-report method is a subjective method itself and its limitations have been already addressed. Nevertheless, in view of the scarce information about skills mismatch in Argentina and the significance of the automotive industry in this country, I believe that this study is highly relevant to shed light on the phenomenon of skills mismatch and the possible measurement methods that exist for our country. Furthermore, this paper may even identify future areas of research.

[68] Asiociación de Fábrica de Automotores. Retrieved from: http://www.adefa.org.ar/

8.1 Self report: Mercedes Benz

The self-report carried out in the firm of Mercedes Benz is included in the Annex of this study and it was performed to 60 employees of the firm. More specifically, it was performed to those employees who work in the production process. This specific area of the firm was chosen to answer the survey because its work force encompasses a large variety of qualifications needed for the numerous stages of its production process.

Actually, there are approximately 2300 employees working at the industrial plant of Mercedes Benz, taking into account all the shifts that are done during a day.[69], It is important to point out that not all of these employees work in the production line. Some of them may work on the administrative or sales sector, among others. Since the survey was performed to just 60 employees, we should not generalize upon it. Nevertheless, interesting ideas and hypothesis may be derived from it.

As regards the self-report carried out, two of the methods mentioned in the Methodology section were included with the objective and hope of obtaining similar results. In addition, a question regarding skills' under-utilization and obsolescence was also included. Since skills under-utilization seems to be a linked phenomenon of skills mismatch, I found interesting analyzing the existence of this phenomenon as well.

Moreover, since we have already studied that some socioeconomic factors seem to help determine the existence of skills mismatch, our survey also included a section in which age, gender and nationality were asked. Although we performed this survey to a small amount of people and the results may not be significant enough, we may still be able to observe some sort of pattern regarding the likelihood of skill mismatch.

[69] *Mercedes Benz anunció que sumará 500 empleados a su planta de Virrey del Pino* (2017). Retrieved from: http://www.el1digital.com.ar/articulo/view/65000/mercedes-benz-anuncio-que-sumara-500-empleados-a-su-planta-de-virrey-del-pino

8.2 Results obtained

The first method used to measure skills mismatch, is the self-report assessment included in the PIAAC survey. As specified in the Methodology section, according to the combination of the answers of two questions, each individual will be classified in one of the following four categories: over-skilled, under-skilled, over-skilled as well ass under-skilled and well-matched.

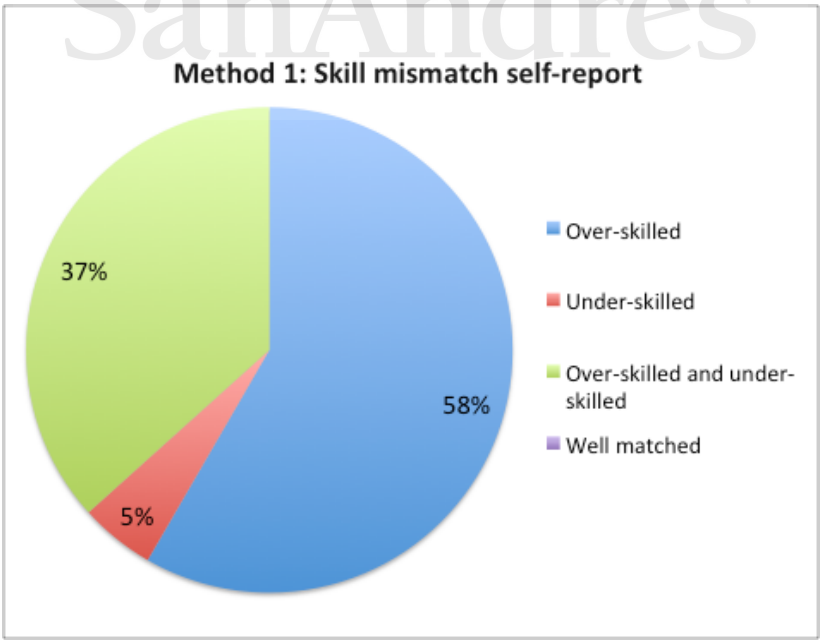
According to the results obtained, 58% of the surveyed individuals were classified as over-skilled, 37% were classified as "over-skilled as well as under-skilled", 5% were classified as under-skilled and none of them as well matched.

Table 3: Results obtained from Method 1

Method 1: Skill mismatch self report	
Category	**Number of people**
Over-skilled	35
Under-skilled	3
Over-skilled and under-skilled	22
Well-matched	0

Source: *Author's elaboration*

Graph 5: Results obtained from Method 1, expressed in percentages.



Source: *Author's elaboration*

As specified above, this is just a pilot survey and thus, we can't derive general conclusions from it. Nevertheless, I believe that the percentage of over-skilling is alarming. As regards the category "over-skilled as well as under-skilled", its meaning is not absolutely clear but it is argued that individuals classified this way might be over-skilled as regards a set of skills while, at the same time, under-skilled as regards another set of different skills.[70] Last but not least, according to this method, 5% of the surveyed people seem to be under-skilled and none of them well matched. This would mean that, in total, 63% of the surveyed people are considered to be either over-skilled or under skilled.

The second method used to calculate skills mismatch is a set of questions included in the European Working Condition Survey (2005) and in the OECD report (2011), among other studies. This second method was added to the survey with the aim of checking if different self-reports obtain similar outcomes. This is to say, this method was added as a "control". According to this second method, an individual may be classified in one of the following three different categories: over-skilled, under-skilled and well matched.

In this case, 58% of the people seem to be over-skilled, 42% well matched and none of them under skilled.

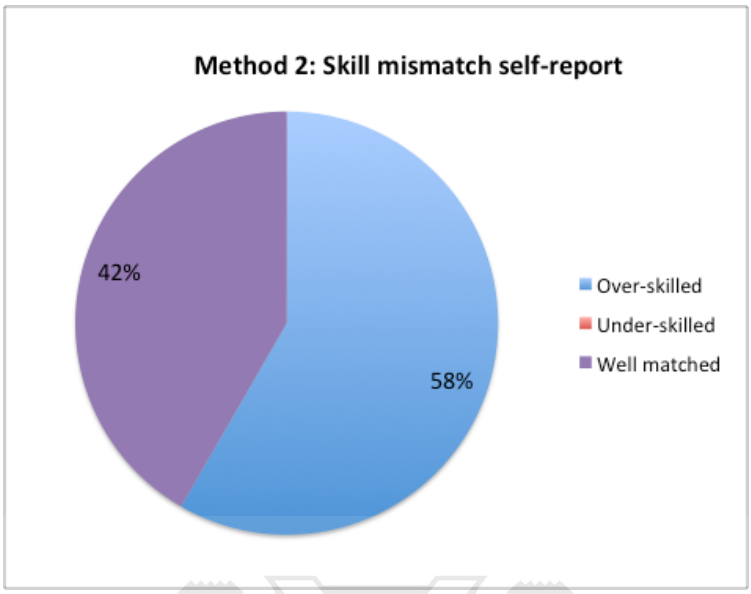
Table 4: Results obtained from Method 2

Method 2: Skill mismatch self report	
Outcome	**Number of people**
Over-skilled	35
Under-skilled	0
Well matched	25

Source: *Author's elaboration*

[70] Perry, A., Wiederhold, S., & Ackermann-Piek, D. (2014). How can skill mismatch be measured? new approaches with piaac. *Methods, data, analyses*, *8*(2).

Graph 6: Results obtained from Method 1, expressed in percentages.



Source: *Author's elaboration*

In my opinion, these are interesting outcomes to analyze. First of all, the percentage of people over-skilled is exactly the same according to both methods. However, 5% of the people are considered under-skilled according to the first method while none of them are considered under-skilled according to the second method. Although these results are not exactly the same, we may agree that a very small portion, relative to the over-skilled portion, is considered under-skilled. Last but not least, 42% of the people are considered well matched by the second method while none of the people are considered well matched according to the first method. This is a very big difference. However, we must remember that the first method includes one category more which is not included in this last method: "over-skilled as well as under-skilled". This additional category may help explain the difference between the percentages of well-matched people. This is to say, perhaps the 42% of well-matched people of the second method *hides* individuals that are considered simultaneously over-skilled and under-skilled. On the other hand, it may also be possible that the unclear category of "over-skilled as well as under skilled" hides well matched people.

Although the results are not exactly the same ones, this was partially expected since the methods have different amount of possible outcomes.

Nevertheless, it is important to note that at least the percentage of over-skilling, which is the most alarming portion, is consistent in both methods.

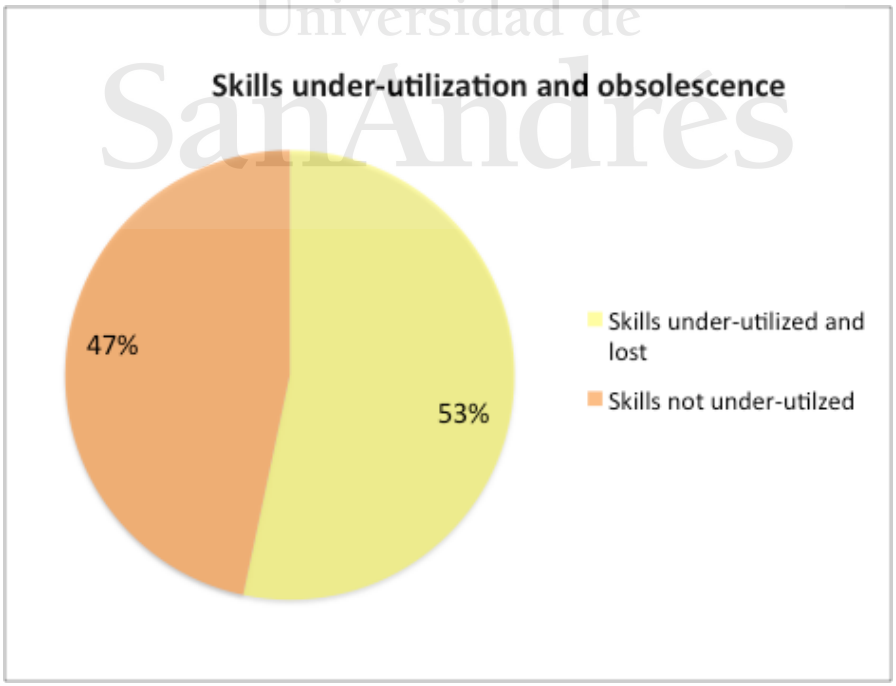
Next, the survey also included one question regarding skills under-utilization and obsolescence. Since this aspect seems to be *theoretically* linked to the existence of skills mismatch, I wanted to assess it empirically. According to the results obtained, 53% of the surveyed people stopped using skills in which they stood out and as a consequence, lost them.

Table 5: Skills under-utilization and obsolescence

Skills under-utilization and obsolescence	
Outcome	**Number of people**
Skills under-utilized and lost	32
Skills not under-utilized and lost	28

Source: *Author's elaboration.*

Graph 7: Skills under-utilization and obsolescence expressed in percentages



Source: *Author's elaboration*

As previously mentioned, skills under-utilization and obsolescence seem to be very linked to skills mismatch and particularly to over-skilling. According to the evidence gathered, this seems to hold in the empirical world too. Skills obsolescence may represent human capital depreciation, which would probably have a negative impact on the economic growth of a country. Therefore, the fact that approximately half of the people surveyed argue that they have lost skills, is alarming as well. Moreover, the fact that these people belong to one of the most important industries of our country, makes it even more alarming. In my opinion, this is worth analyzing at a larger scale.

Finally, possible socioeconomic determinants (age, gender and nationality) of skill mismatch were also included in the self-report with the objective of analyzing any observed pattern. Unfortunately, regarding immigrants, no pattern was observed: all the surveys were answered by native citizens of Argentina. Regarding gender, at the beginning of this study it was argued that women are more likely to be affected by skills mismatch than men. However, very few women answered the survey as well. More specifically, just 15% of the assessed people were women. The small proportion of women involved was not surprising since the majority of individuals who work in the production process are usually men. Nevertheless, it is important to note that according to method 2, 77% of the surveyed women were categorized as over-skilled while 23% well matched. On the other hand, 56,25% of the surveyed men were considered over-skilled while 43,75% were considered well matched. Although this is an interesting finding that corroborates an initial argument of this study regarding gender, we must remember the fact that there were very few women and men surveyed, Therefore, we should not generalize upon this result. As regards age, it was argued that with increasing experience and age, skill mismatch was expected to decrease. Unfortunately, a conclusion couldn't be drawn about this determinant either. Half of the youngest people (18 – 24 years) were considered over-skilled while the other half, well matched. Similar proportions were found for people between 25 and 35 years old and people between 36 and 45 years old. We would have expected a majority of young people being over-skilled or under-skilled and a small proportion of skill mismatch present in older people. Nevertheless, it must be noted that few people of 18-24 and 36-45 years old were surveyed, most of the

surveyed people were categorized under the range of 25-35 years old. Thus, if performed at a larger scale, the results may follow the predicted pattern.

In my opinion, carrying out this survey to a larger amount of people would reveal and/or confirm very interesting and possible determinants of skills mismatch. Although this self-report was performed as a pilot survey to illustrate what may be done with more time and resources, interesting ideas may be derived from it. Due to the fact that more than 50% of the people surveyed was categorized as over-skilled by two different self-report methods and due to the consequences that skill mismatch entails, I believe that a survey performed at a larger scale is absolutely worth it. In my opinion, this phenomenon must be measured and analyzed at a larger scale in Argentina, as it is being analyzed in other countries, developed and not developed ones. In addition, if a larger survey is performed to different industries of the country, other socioeconomic and labor market determinants not included in the survey but analyzed in this study may be added. Some examples would be: type of contract, size of the firm and marital status, among others.

9. Conclusions

In conclusion, I believe that due to the consequences that it entails and have been addressed in this study, skills mismatch is certainly as concerning as expected. As explored above, this phenomenon may have large implications on individuals, firms and ultimately, at a macroeconomic level. Investing in skills and making sure that they are well matched with jobs is fundamental for the economic growth of a country. [71]Several developed and developing countries have already demonstrated their concern about the phenomenon of skills mismatch. However, scarce studies have been carried out in Argentina and thus, scarce concern towards this phenomenon, if any, has been demonstrated in this country.

As analyzed initially in this study, skills mismatch is not the same as qualification mismatch. The term *qualification* represents the skills that are obtained through formal training but does not consider skills acquired in other scenarios. Although education/qualification mismatch is easier to measure than skills mismatch, they are not the same. Nevertheless, the few studies performed in our country about these issues were mainly focused on the phenomenon of qualification mismatch rather than skill mismatch.

Although we don't have objective data on skills or extensive surveys, such as the PIAAC, performed in our country, we must remember that there is no universally measure of skills mismatch accepted worldwide. Thus, even though it possesses its limitations, the self-report method may provide valuable information about the existence of skills mismatch in our country.

In addition, another important section of this study analyzed the socio economic determinants of skills mismatch. Women, young people and immigrants, among others, seem to be more prone to be mismatched. In my opinion, this is not a minor detail since women compose approximately 41.1% of Argentina's labor force.[72] Additionally, Argentina has a labor force participation rate of 42% for ages

[71] European Commission (EC). (2012). *Rethinking education: investing in skills for better socio-economic outcomes*. Strasbourg city, Strasbourg.

[72] The World Bank. (2015). Retrieved from: http://data.worldbank.org/indicator/SL.TLF.TOTL.FE.ZS

15-24. [73] This is to say, this country has a high percentage of its labor force that seem to be prone to be mismatched.

Moreover, I consider this study valuable because the phenomenon wasn't only deeply anayzed but a pilot self-report was also carried out in the automotive industry of Argentina. More specifically, in the known firm Mercedes Benz. Since only 60 people were surveyed, no generalizations should be made upon the results. Nevertheless, I consider that the results obtained are alarming. According to the two different self-reports used, 58% of the surveyed individuals were classified as over-skilled. This may not be a completely reliable outcome but the fact that both methods are consistent with it and the fact that it encompasses more than half of the people surveyed, transmit the idea of a high amount of employees being affected by the phenomenon of skills mismatch. Particularly, these facts transmit the idea of a high amount of employees being affected by over-skilling. In addition, although the two self-reports reached different percentages of under-skilled employees, both measurement methods coincide on the fact that a considerably low percentage of employees suffer from under-skilling, relatively to over-skilling. The high percentage of over skilled people would probably represent a high level of human capital under-utilization, which could ultimately represent a barrier for the economic growth of the country.

If we were to use this method to generalize within the automotive industry, the high percentage of over skilling would support the hypothesis initially presented in this study: nowadays, skills shortage does not seem to be the main challenge of the labor market but instead, the misallocation of skills does. This is to say, skills don't seem to be scarce but allocated incorrectly. Over-skilling could be caused by the existence of scarce high skilled jobs or by the fact that recruiting processes are demanding more skills than the ones that are actually necessary for the jobs, among other causes. According to the first scenario, more high skilled jobs should be created in Argentina and according to the second scenario recruiting departments should re-think their strategy. As mentioned earlier in this study, Beccaria (2006) reached to the result that, in Buenos Aires, 20% of the analyzed

[73] The World Bank. (2016). Retrieved from: http://data.worldbank.org/indicator/SL.TLF.ACTI.1524.ZS

job positions were demanding over educated people. This is to say, the recruiting processes were requesting more qualifications than the ones actually required by the jobs. Therefore, the same may be happening with skills.

As already mentioned, the results of this study shouldn't be used to make generalizations. Nevertheless, together with the deep analysis of skills mismatch presented in this study, they could be used as a starting point to encourage a richer analysis of this phenomenon. Not only because of the implications that it entails but because one of the most relevant industries of Argentina seems to be affected.

In addition, the fact that 52% of the surveyed people seem to be suffering from skills obsolescence is alarming as well. As mentioned previously in this study, the existence of skills obsolescence may represent a depreciation of human capital that could affect in a negative way the productivity of the firms involved and ultimately, the economic growth of the country. This issue could be addressed at a firm level. For example, firms could encourage ongoing learning for employees of all ages and recurrent training sessions of different set of skills. It is argued that an adequate learning culture, the provision of autonomy and the availability of opportunities for employees to develop their skills can mitigate this depreciation.[74]

Overall, I consider this study valuable for different reasons. First of all, it provides a deep analysis of a phenomenon which seems to be one of the major challenges of the labor market nowadays. This paper analyzes skills mismatch including its causes, consistency with economic theories, socioeconomic determinants, labor market determinants, measurement methods, previous findings and consequences, among other aspects. In addition, a pilot self report was carried out with the objective of measuring the extent of skills mismatch in one of the most important industries of Argentina and providing an example of what could be done with more time and resources. Lastly, I truly hope that this study encourages an analysis of skills mismatch at a larger scale in our country.

[74] European Centre for the Development of Vocational Training (2012). *Briefing Note: Preventing Skill Obsolescence.* Greece: (n.p.).

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11. Annex: Survey

Please mark with an X the answer that you consider correct or fill in the blank.

Age: _____
Gender: _____
Nationality: _____

1. Do you feel that you have the skills to cope with more demanding duties than those you are required to perform in your current job?

- ☐ Yes
- ☐ No

2. Do you feel that you need further training in order to cope well with your present duties?

- ☐ Yes
- ☐ No

3. Mark with an X the statement with which you feel most identified:

- ☐ I need further training to cope well with my duties
- ☐ My duties correspond well to my skills
- ☐ I have the skills to cope with more demanding duties

4. Did you stop using some skill in which you stood out and consequently, you do not have it any more?

- ☐ Yes
- ☐ No