



DETERMINING THE EFFECT OF INDUSTRIAL CLASSIFICATION ON EMPLOYMENT STATUS

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Abstract: Recent trends in the Philippine labor market indicate shifts in the employment sector wherein there has been a decline in the agricultural sector, a boom in the services sector and stagnant industrial sector. According to the National Statistical Coordination Board (2012), 50.85% of the Filipino workers were employed in the services sector, 33.61% in the agricultural sector, and 14.73% in the industrial sector in 2010. Due to risks in terms of job stability related to each industrial classification, workers employed under certain work types correspond to a probabilistic outcome of being permanently, seasonally and temporarily employed. Other than belonging to a particular industry, socio-demographic factors such as the age, sex and educational attainment of the household head affect employment status. As a framework in analyzing the Philippine labor market, we examine the human capital theory and its implications on the signaling and screening process as well as the competition, search and assignment of jobs. We utilize the Community-Based Monitoring System (CBMS) 2008 data set and implement a multinomial logistic model to determine the likelihood of a worker obtaining a certain status of employment given industrial classification, highest educational attainment and gender. Our results indicate the importance of educational investment in obtaining permanent jobs, which are more likely to be had in the services sector under the financial intermediation, hotel & restaurant, and real estate, renting & business industries. Also, there is a presence of gender bias in the workplace wherein elementary and high school graduate males have more stable jobs. Given these results, we wish to address the information asymmetry by providing adequate information that will give direction for potential employees and future employers.

Keywords: employment status; human capital theory; industrial classification; labor market; multinomial logit

1. INTRODUCTION

Recent decades demonstrate a trend in the Philippine labor market as evidenced by shifts in the employment sector. According to the National Statistical Coordination Board [NSCB] (2012), the Philippine labor force is comprised of 50.84% in the service sector, 33.61% in the agricultural sector and 14.73% in the industrial sector for the year 2010, implying high dependence of employment levels on the demand for labor in the service sector. Figure 1 shows employment in percentages according to 12 possible industries of employment which can be categorized into the three main sectors. Most workers tend to be concentrated in the agricultural sector while the manufacturing sector takes one of the smallest proportions of employed workers.

Employment in each sector can render a laborer as being in one of the different employment statuses. For purposes of brevity, only the 3 statuses which our study is looking into

will be discussed. The Community Based Monitoring System (CBMS) specifies them as: *Permanent*, *seasonal*, and *temporary* workers. Permanent workers are those with an indefinite working tenure, without any foreseen termination. Seasonal workers are called to work depending on the seasonality of the assigned activity. Temporary workers are those with a definite, limited working tenure, with a foreseen termination of contract.

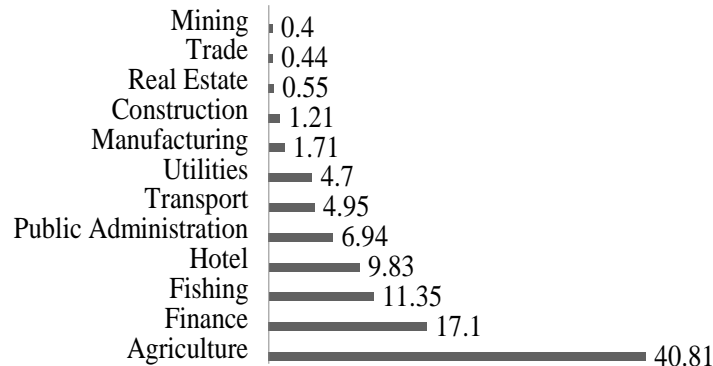


Figure 1. Employment According to Industry (in %)
 Source: CBMS (2008)

Employment plays a vital role in human development, and ultimately, in economic growth and development. Similarly, Jurado & Sanchez (1998) illustrate that employment is able to satisfy one's basic needs in the form of wages as well as through training and experience. Hence, given the current state of the Philippine labor market in relation to industry classification, we work with the human capital theory as an underlying framework to model such employment scenarios. We aim to achieve the following objectives:

1. To determine the probability of achieving a certain employment status as being permanently, seasonally or temporarily employed with emphasis on the advantages of other industry classifications;
2. To determine the effects of higher educational attainments to employment status via the human capital theory;
3. To examine if there is a gender bias related to educational attainment and types of work with respect to employment stability.

In line with the supply of skilled workers in the Philippines, there is a distorted incentive system that influences the education and employment decisions of individuals. As a result, the country is confronted with a severe shortage of individuals possessing specialized knowledge in various other fields, given that a large proportion of its labor force is continuously moving to an industry which is oversaturated. Hence, this study seeks to address the market failure otherwise known as asymmetric information. In order to channel the workforce into non-saturated



industries, efforts must be exerted in matching students' and workers' preferences to emerging industries, instead of oversaturated ones, to attain desired employment levels for each industry.

2. LITERATURE REVIEW

2.1 Employment sectors in the Philippines

2.1.1 Decline in the agriculture sector

Although there has been an influx of workers to the services sector, there has also been a decrease in the number of those engaged in the agricultural sector. The share of agricultural activity to total employment has been declining, from 51.4% in 1980 to 36.1% in 2007. Ironically, the shift of labor supply from the agricultural sector, which is a feeder of unskilled and low-productivity workers, directed to the service sector instead of the manufacturing sector where more stable, permanent jobs are generated (Todaro, 1969; Aldaba & Hermoso, 2009). The interesting redirection is potentially caused by the sector's need for highly skilled workers, and as well as the different costs associated with it such as physical and psychic costs.

2.1.2. Boom in the services sector

The rise in the level of service exports can be attributed to the sector's rise in employment wherein there has been a boom in the demand for commercial services exports by developed countries (Pasadilla, 2006). Given the offshoot of "technological advances", low- and middle-income economies are taking advantage of the opportunities brought about by "global sourcing activities", e.g. business process outsourcing (BPO). This does not only involve employment by FDIs and service exports but it also entails voluntary, physical deployment of labor, such as the case of overseas Filipino workers [OFWs] (Goswami, Mattoo & Sáez, 2012). According to the Philippine Overseas Employment Administration (POEA), deployed OFWs were recorded at 1,470,826 in 2010, an additional 3% increase from 2009. However, the increasing wave of migrant workers met the increased demand from different countries, there still remains to be an oversaturation here in the source country.

2.1.3. Stagnant industrial sector

Despite the rapid growth rate of the services sector, Yap & Del Prado (2007) assess the BPO industry in India wherein the low value-added to the firm and the minimal positive externalities brought about by service sector investments induces shifts in the labor supply towards other industries. Clearly, although there seems to be more opportunities in the services sector, these seem to be short-term and unsustainable. We now look to the manufacturing sector for sustainable, permanent employment. Batungbacal (2011) illustrates an unfortunate, albeit

agreeable, reality that although the industrial sector is growing, it is not growing fast enough to cope with the rising levels of population, as well as with the increasing rate of unemployment coming from the agricultural sector. Moreover, he recognizes the shift of employment from agricultural to the service sector, stating that the jobs such rural workers could get in the manufacturing sector could entail higher value-added output than in the service sector.

2.2 Factors affecting employment status

In line with this, the labor market both domestic and abroad prefers more competent workers that pass certain qualifications. The probability of being employed depends on various characteristics such as sex, height and academic performance; more so are the demands for overseas workers which even demand licensure examinations and other migrant requirements. However, education is deemed to have the greatest weight and most pertinent in determining labor market status. As such, more educated and skilled workers are preferred. Statistically, in the case of the Philippines from year 1994 to 2006, employment rate of those who attained a primary-level degree or less declined significantly, while that of those who have completed secondary and tertiary levels increased (Hasan & Jandoc, 2009).

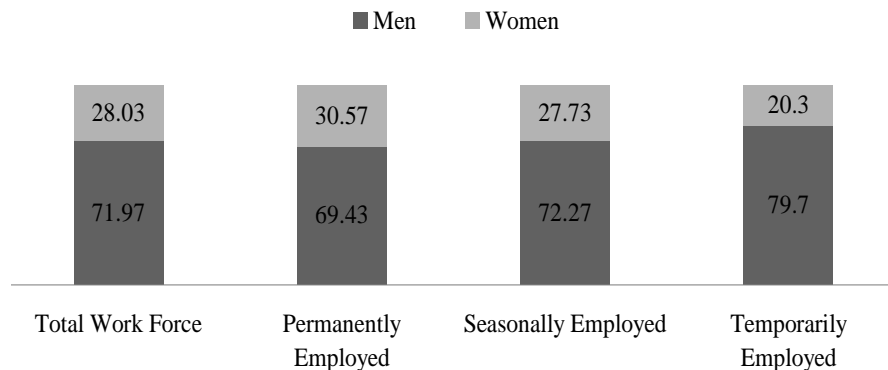


Figure 2. Employment Status According to Gender (in %)
 Source: CBMS (2008)

On the other hand, the disparity between the opportunities provided to men and women across all sectors places women at a greater disadvantage. Figure 3 illustrates how men generally occupy the same proportion of the market for each status of employment, including that of the total work force. Significant threats arise from widening the disparity, while great opportunities come from empowering women to become active and not passive members of the labor force. As evidenced by Figure 2, women tend to pursue higher degrees of education and take the larger proportion of demand for it. This can be explained by the limitations supposedly imposed onto them for society for them to be deemed equally or even more productive as men.

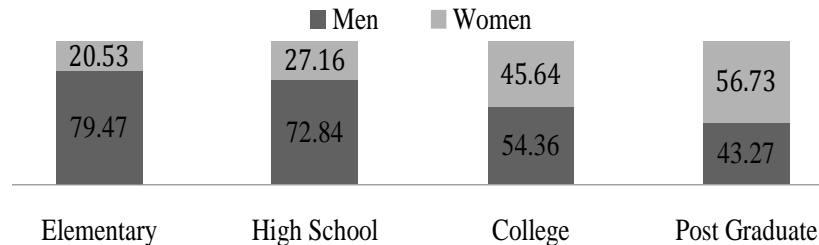


Figure 3. Educational Attainment According to Gender (in %)
Source: CBMS (2008)

2.3 The human capital theory in the labor market

Todaro & Smith (2006) define human capital as an investment to be accumulated wherein individuals weigh the costs undertaken in the near term to expected future benefits. In relation, Ehrenberg & Smith (2006) enumerate the costs of adding to human capital to include direct and indirect expenses, forgone earnings and psychic losses; expected returns are in the form of higher future earnings, increased job satisfaction, appreciation of non-market interests as well as prestige (Weisbrod, 1966; Lynch, 1991; Becker, 1992).

In the *signaling and screening hypothesis*, education primary serves as a screening device to aid employers in hiring ideal employees elicit signals of having greater skill sets and higher productivity. Furthermore, the presence of *job competition theory* indicates the battle job applicants for a certain position, and that they are ranked according to their qualifications (i.e., educational attainment). As such, there is a possibility of over-education to place oneself at an advantage. On the other hand, *job search theory* states that job search is costly in terms of time and effort, which are associated to labor mismatches due to imperfect information. Additionally, the *assignment theory* states that an individual's future productivity and earnings are related to the nature of the job while the *labor market segmentation theory* highlights that this may be due to the different characteristics and behavioral rules related to each particular market.

3. METHODOLOGY

Our study comprises of cross-section data which was obtained from the Community-Based Monitoring System (CBMS) during the year 2008. Specifically, the data set derived from the city of Pasay, with a vast array of 112,197 observations, will be used. We implement a qualitative response model, specifically the multinomial logistic model which allows us to estimate the probabilities of obtaining each employment status given independent variables that differ in nature. The multinomial logistic specification of our model is:

$$EMPLO_i = \beta_0 + \beta_1 EDUCA_i + \beta_2 INDUS_i + \beta_3 (SEX_i)(EDUCA_i) \quad (\text{Eq. 1})$$



$$+\beta_4(SEX_i)(EDUCA_i) + \beta_5SEX_i + \beta_6AGE_i + \beta_7AGE_i^2$$

Where:

$EMPLO_i$ represents employment status which is given by 3 categorical outcomes which are mutually exclusive.

$$EMPLO_i = \begin{cases} 1 - \text{Permanently employed} \\ 2 - \text{Seasonally employed} \\ 3 - \text{Temporarily employed} \end{cases}$$

$EDUCA_i$ is a vector of dummy variables comprising the highest educational attainment of the household head, which can be either completed elementary ($ELEM_i$), high school ($HIGHS_i$), college ($COLGE_i$) and post-graduate studies ($POSTG_i$), with the base category that the individual not completing any form of education.

$INDUS_i$ represents a vector of dummy variables pertaining to a certain industry or field ranging from the general agricultural, industrial, and services sectors.

As for the demographic variables, SEX_i is a dummy variable to measure the differential effect of belonging to a specific gender class. To gauge the importance of gender in the labor market, $(SEX_i)(EDUCA_i)$ and $(SEX_i)(INDUS_i)$ are interaction variables for educational attainment and industrial classification, respectively. AGE_i is a variable to capture the age of the respondent and its squared term AGE_i^2 from the assumption that AGE_i is concave and reaches a positive extrema before diminishing.

4. RESULTS AND DISCUSSION

Overall, our results show the point three important points: First, educational investment is a necessary driver in obtaining permanent jobs via the human capital theory. There is a positive marginal effect between higher educational attainment and the probability of being employed permanently. These suggest that the labor market ascribes to the signaling and screening process. However, the same cannot be observed for seasonal and temporary employment.

Second, permanent employment is more likely in the services sector under the financial intermediation, hotel & restaurants business, and real estate, renting & business activities. Results suggest that since these industries require higher investment, higher expected earnings will accompany the expenses acquired and the difficulty of their courses. Also, employers are aware of capabilities and so offer more permanent jobs. Also, the difficulty in entering these sectors is offset by the greater chances of being permanently employed. On the other hand, an individual is least probable to be permanently employed are the public administration & defense,



manufacturing, and mining sectors. Moreover, going into public administration & defense and the wholesale & retail trade sector yields the highest probability of being only seasonally employed, while the agriculture, hunting & forestry sector being the most probable choice for temporary employment.

Third, there is a bias for males with elementary and high school educational attainments in acquiring more stable jobs. There may be a bias towards gender class, regardless of another applicant of the other gender having a similar educational attainment. It is possible that females are less capable of displaying their signals of productivity with an educational attainment less than a college degree. However, results may be thought of as misleading due to job requirements being more suitable for men (i.e., construction work) or for women (i.e., secretarial work) in particular.

5. CONCLUSION

Recent trends in the Philippine labor market however show the services sector being the more popular choice of industry. While the underemployment in other sectors has corresponding macroeconomic repercussions, there are also implications in the microeconomic level in terms of risks in job stability. Quality employment translates to higher income, and higher income opens access to higher welfare. Workers who are well-off in terms of welfare tend to be more productive, and contribute positively to economic activity.

Evidently, the preconceived notion towards sectors with higher expected returns has mainly led to an oversaturation of the job market. Correspondingly, the problem may not be in the lack of job opportunities but in the wrong signaling and mismatch of labor demand to supply – there is information asymmetry. So, we justify the necessity to invest in human capital as serves as a signal that allows employers to screen employees efficiently. However, we call on the role of the government beyond providing quality public education in pushing efforts to direct and advise future college enrollees or those applying in technical-vocational courses as to what the labor market needs. Likewise, there must be a response from educational institutions in updating their teaching methods and necessary curriculum to foster higher productivity for future workers. Adequate information provided for by the government and schools will address the costly investments in education and in job search.

In addition, we probe on the issue of women empowerment to overcome gender bias. Since results indicate less job stability for females with lower attainments, this is associated to the less educated females living in the more impoverished conditions. The government must be more pursuant in offering them technical-vocational courses to guarantee stable employment to harness their ability to contribute to society beyond non-work pay and household work.



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8. APPENDIX

Table 1. Classification of Industries According to Major Sector

<i>Agricultural Sector</i>	Agriculture, Hunting and Forestry; Fishing;
<i>Services Sector</i>	Wholesale & Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal Household Goods; Hotel and Restaurants; Transport, Storage and Communication; Financial Intermediation; Real Estate, Renting and Business Activities; Public Administration and Defense; Compulsory Social Security
<i>Industrial Sector</i>	Mining and Quarrying; Manufacturing; Electricity, Gas and Water Supply; Construction;

Table 2. List of Variable Names

<i>PARAMETER</i>	<i>DESCRIPTION</i>
Educational Attainment	
<i>ELEM_i</i>	1 if the respondent completed elementary; 0 otherwise
<i>HIGHS_i</i>	1 if the respondent completed high school; 0 otherwise
<i>COLGE_i</i>	1 if the respondent completed college; 0 otherwise
<i>POSTG_i</i>	1 if the respondent completed post-graduate studies; 0 otherwise
Industrial Classification	
<i>AGRIC_i</i>	1 if the respondent is employed in Agriculture, Hunting and Forestry; 0 otherwise
<i>FISH_i</i>	1 if the respondent is employed in Fishing; 0 otherwise
<i>MINE_i</i>	1 if the respondent is employed in Mining and Quarrying; 0 otherwise
<i>MANUF_i</i>	1 if the respondent is employed in Manufacturing; 0 otherwise
<i>UTLTY_i</i>	1 if the respondent is employed in Electricity, Gas and Water Supply; 0 otherwise
<i>CONS_i</i>	1 if the respondent is employed in Construction; 0 otherwise
<i>TRADE_i</i>	1 if the respondent is employed in Wholesale & Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods; 0 otherwise
<i>HOTEL_i</i>	1 if the respondent is employed in Hotel and Restaurants; 0 otherwise
<i>TRANS_i</i>	1 if the respondent is employed in Transport, Storage and Communication; 0 otherwise
<i>FINAN_i</i>	1 if the respondent is employed in Financial Intermediation; 0 otherwise
<i>REALE_i</i>	1 if the respondent is employed in Real Estate, Renting and Business Activities; 0 otherwise
<i>PBLIC_i</i>	1 if the respondent is employed in Public Administration and Defense; Compulsory Social Security; 0 otherwise
Demographic Variables	
<i>AGE_i</i>	Age of the respondent
<i>AGESQ_i</i>	Squared age of the respondent
<i>MALE_i</i>	1 if the respondent is male; 0 otherwise
Interaction Variables	
<i>MELEM_i</i>	<i>MALE_i x ELEM_i</i>
<i>MHIGH_i</i>	<i>MALE_i x HIGHS_i</i>
<i>MCOLG_i</i>	<i>MALE_i x COLGE_i</i>

$MPOST_i$ $MALE_i \times POSTG_i$
 $MAGRI_i$ $MALE_i \times AGRIC_i$
 $MFISH_i$ $MALE_i \times FISH_i$
 $MMINE_i$ $MALE_i \times MINE_i$
 $MMANU_i$ $MALE_i \times MANUF_i$
 $MUTLT_i$ $MALE_i \times UTLTY_i$
 $MCONS_i$ $MALE_i \times CONST_i$
 $MTRAD_i$ $MALE_i \times TRADE_i$
 $MHOTL_i$ $MALE_i \times HOTEL_i$
 $MTRAN_i$ $MALE_i \times TRANS_i$
 $MFINA_i$ $MALE_i \times FINAN_i$
 $MREAL_i$ $MALE_i \times REALE_i$
 $MPBLI_i$ $MALE_i \times PBLIC_i$

Table 3. Marginal Effects on Employment Status After Multinomial Logit

Variables	Permanently Employed	Seasonally Employed	Temporarily Employed
$ELEM_i$	-0.0722***	0.0719***	0.0003
$HIGHS_i$	-0.0537***	0.0777***	-0.0240**
$COLGE_i$	0.1864***	-0.0846***	-0.1018***
$POSTG_i$	0.3052***	-0.1783***	-0.1269***
$AGRIC_i$	0.2068***	-0.1725***	-0.0344*
$FISH_i$	0.2133***	-0.1430***	-0.0703***
$MINE_i$	0.1619**	-0.2087***	0.0468
$MANUF_i$	0.1399***	-0.1441***	0.0043
$UTLTY_i$	0.0372	-0.0581	0.0209
$CONST_i$	0.0909	-0.0708	-0.0200
$TRADE_i$	0.2207***	-0.1070**	-0.1138***
$HOTEL_i$	0.2689***	-0.1966***	-0.0723***
$TRANS_i$	0.1956***	-0.1774***	-0.0182
$FINAN_i$	0.2690***	-0.1616***	-0.1074***
$REALE_i$	0.2282***	-0.1707***	-0.0575***
$PBLIC_i$	0.1367***	-0.1083***	-0.0285
$MALE_i \times ELEM_i$	0.0628***	-0.0529***	-0.0099
$MALE_i \times HIGH_i$	0.0593***	-0.0462**	-0.0131
$MALE_i \times COLG_i$	-0.0781***	0.02321	0.0548***
$MALE_i \times POST_i$	-0.1440**	0.1578	-0.0137
$MALE_i \times AGRI_i$	-0.0267	-0.0258	0.0524
$MALE_i \times FISH_i$	-0.1603	0.0811	0.0792
$MALE_i \times MINE_i$	-0.1857	0.1641	-0.0215
$MALE_i \times MANU_i$	-0.0146	0.0270	-0.0417
$MALE_i \times UTLT_i$	-0.0794	0.0291	0.0503
$MALE_i \times CONS_i$	-0.1564	-0.0439	0.2001
$MALE_i \times TRAD_i$	-0.2473	-0.2140	0.4613
$MALE_i \times HOTL_i$	-0.0473	0.0081	0.0392
$MALE_i \times TRAN_i$	-0.0058	-0.0082	0.0140
$MALE_i \times FINA_i$	-0.0149	-0.0285	0.0435
$MALE_i \times REAL_i$	-0.0119	-0.0051	-0.0068
$MALE_i \times PBLI_i$	-0.0253	-0.0570	0.0822
$MALE_i$	0.0387	-0.0001	-0.0381



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AGE_i	0.0036***	-0.0025***	-0.0011***
$AGESQ_i$	-0.0000***	0.0000***	0.0000***
Predicted Probability	0.4883	0.3823	0.1294
*** Significant at the 1%, ** Significant at the 5%, * Significant at the 10%			