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Unlimited and abundant labor supply: Econometric and other evidence in Philippine industry

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**Unlimited and Abundant Labor Supply:
Econometric and Other Evidence in Philippine Industry**

by
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Unlimited and Abundant Labor Supply: Econometric and Other Evidence in Philippine Industry

by

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Abstract

The paper examines the Philippine labor market by fitting a labor supply equation using detailed firm data from the survey of manufactures. The Philippines continues to have high rates of unemployment and underemployment amidst a continuously rising labor supply. The results of the econometric effort confirm the description of the economy as falling within the zone of abundant labor supply at best if not within in the unlimited zone of labor supply. Segregating the different sizes of firms as individual characteristics does not change the basic econometric finding. The study further incorporates the effects of specific industry groupings, of which some were at the 3-digit level of aggregation. Taking account of specific industry characteristics brings out some unique findings. Labor intensive export industries and some wage goods industries organized under large firms tend to be sensitive to movements in the wage rate. But these industry groups are the exception rather than the rule and the values of the statistically significant aggregate wage response coefficients are very low values and almost close to zero. The paper further analyzes the wage differentials among major occupational groups and the nature of labor supply among professionals and technicians that require the passing of state administered board examinations. In general, both types of analysis provide additional confirmation of the excess labor supply at the level of the educated work force.

Key words: Labor market, Supply of labor, Philippine labor market, Philippine economy, Employment, Wage income, Occupational wage differentials

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*Gerardo P. Sicat**

Abstract

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I. Domestic wage rate, unemployment and underemployment: theoretical and empirical considerations

In the course of economic development, countries with rapid rate economic growth experience the scarcity of the labor supply sooner or later. As a consequence, the domestic wage and hence the take home pay of most workers rise. Even when the supply of labor is abundant and cheap initially, as economic growth moves the economy forward, employment of labor begins to erase the abundance of labor. In this case, the phenomenon of rising wages takes place. The rise of domestic wages and per capita incomes among East Asian economies is one such result. In this process of growth, demographic transition – a process of reduced demand for children arising from rising prosperity and other social and economic conditions – often helps to speed up the reduction of the large supply of labor seeking productive work because with less population growth, the labor force also does not grow as much.

* Professor of Economics Emeritus, University of the Philippines School of Economics. I am grateful to Rose Edillon and Sharon Faye Piza of the Asia Pacific Policy Center for re-instilling my interest in labor market issues and for introducing me to the large set of economic data that they have shared with me.

The celebrated model of W. Arthur Lewis [1954] on economic development under unlimited supplies of labor is a macroeconomic construct for developing economies that describes the endless availability of cheap labor at a given market wage. It is the classic face of structural reasons for poverty: excess labor amidst the absence of sufficient economic opportunities to use up the labor supply. In effect, this economic model postulates that industry could avail of a large pool of labor at a market wage that remains unchanged and inexpensive because the supply of labor is plentiful. An offshoot of the Lewis framework is the Ranis-Fei [1959] model of development which was used during the 1960s to analyze the development of some East Asian economies, notably Taiwan, especially during the economic turning points from unlimited and abundant labor to one of relative labor scarcity as growth erased the excess labor.

Unlimited labor is much assumed in the economic development literature of many countries, but little or no effort has been made to measure its existence within the context of economic relationships that determine the supply of labor. This might be due to an obvious point. When there is persistent unemployment and underemployment in an economy, it is easy to conclude that there is no more reason to belabor the existence of excess labor. But another reason could be the lack of systematic data that could be used to research the problem. A stronger, practical reason is that the eradication of poverty in poor countries is essentially one of generating gainful occupations to absorb unemployed labor. Therefore, the focus of studies could be put in the other areas that lead to employment creation, investment and technological development.

For this reason, the main focus of economic growth and development has been on capital accumulation and on raising worker productivity, of technical change, and of course on those factors that enhance the improvement of labor skills. Any review of the literature on economic development pays little attention to the problem of labor abundance except to assume and acknowledge it. The recent edition of a leading textbook of selected readings on development (Meier and Rauch, 2005) selects some paragraphs from Arthur Lewis but deals more with many other issues of development.

Unlimited supply of labor is recognized as a feature of development at a low stage when the labor force is in excess of job opportunities in the economy. It is also a feature of countries that are effectively challenged by a high supply of labor even as they achieve some measure of success in moving forward. This paper seeks to address this topic in the context of the Philippine labor situation. The success of the Philippine economy to generate new jobs to absorb the country's large labor force is limited (Sicut, 2004).

A realistic presentation of the Lewis model consistent with usual theory and that of his original presentation is a labor supply as shown in Figure 1. At a given wage rate that is exogenously determined by the market or by subsistence wage or by mandated minimum wage, labor is available for hiring until all "excess" labor is absorbed in employment. That is a *zone of unlimited supply of labor*. Point **a** of the supply schedule is a critical point where any further the scarcity of labor makes it possible to hire further labor only at a higher price.

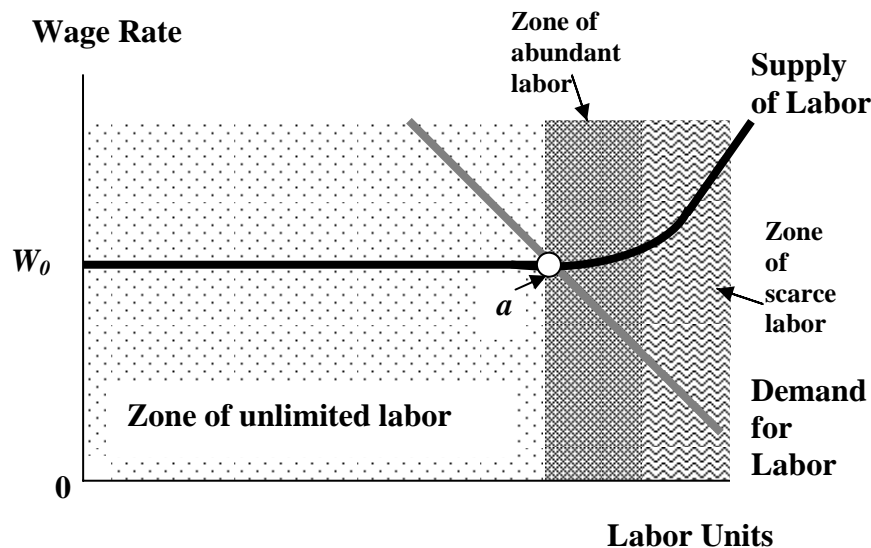


Figure 1

On the unique point **a**, where aggregate demand for labor is in balance with the labor supply, a transition in the labor supply takes place. Any demand for labor that is to the right of point **a** is to be available only with some increase of the wage rate. But unless the demand for labor is sufficiently large, the labor supply would still be within a zone where wage increases would still be very limited and would raise wages only very minimally. Immediately to the right of point **a** is a *zone of abundant labor*. Within that zone, the wage rate could only rise at an unhurriedly slow rate even as more labor is brought to gainful employment. In part, this is caused by the large amounts of micro-adjustments happening to thousands (if not millions) of members of the labor force as they move from employments of low pay to employments of higher pay and productivity. As a result, this zone of abundant labor could take a long time if the economy's growth of demand for labor does not grow sufficiently strong through an increase of investments and the growth of highly productive investments that is brought in by higher capital-labor proportions in those investments.

The *zone of scarce labor* is reached when labor supply becomes quite tight. Any further increase in labor demand could only be secured at higher wage rates. This is the phase where even government regulations on increases in the minimum wage and other legislation raising labor standards would have less impact on the decline of employment level.

Countries with impressive growth rates have rising aggregate demand for labor that pushes the average incomes of workers higher as a result. For these countries, perhaps it would be safe to say that they are now beyond the unlimited supply of labor phase in their economic development. And some of them are beginning to leave the abundant labor phase of their labor market behavior. Those with insufficient aggregate demand for labor are within the zone where even increasing employment does not affect the average incomes of

the working men. They are either right in the midst of the unlimited zone of labor. Or they cannot escape the prolonged agony of being situated within the zone of abundant labor.

In the Philippines, a high rate of unemployment and persistent underemployment continues to be a feature of the economy. Despite the growth experience of the past, the aggregate demand for labor is unable to erase the wide gap between jobs and supply of labor. Statistics of unemployment during the 1990s to the current years has ranged at 8% to 9% of the labor force with a high estimate of underemployment among those employed continues create a problem for policy makers. Compared with the more successful East Asian countries where unemployment is no longer a major problem, the experience with high unemployment and underemployment rates remains a prominent issue. The face of this problem is the implication on the fight against poverty. The Philippines continues to be challenged by this problem.

It is of great interest to estimate the response of labor to the wage rate: this is tantamount to the fitting of a labor supply schedule. With appropriate data on labor employment and wages such a labor supply equation is possible. Further characteristics of the enterprises hiring the labor force could be used to help refine the estimated equation. Moreover, any grouping of the labor force could be further examined if corresponding wages associated with each grouping are also available.

Factors that determine the labor force supply are many. These include the determinants of population level on the one hand and the economic factors at the household that determine labor force participation rates. In particular, the participation of young people and of women in the labor force is very critical in shaping the labor supply. Social and other economic factors shape the activities of women and of children during schooling age. The income of the household determines whether these population members are in or outside the labor force, that is, whether children are in school and women remain in the household or they are out in the labor force swelling the ranks of those seeking jobs.

Casual observations supporting the hypothesis of unlimited labor supply are plenty. Job openings of reputable companies often immediately produce a long line of applicants. A common sight in urban and rural landscapes is the congregation in their neighborhoods on a daily basis of adults – both male and female – in idle chat or low productivity endeavors. Whenever the urban traffic moves slowly, adults take an active role in finding opportunities for trading: street vendors selling a variety of portable goods from cigarettes, refreshments, and household items mix with the crowd. The perennial encounters with young peddlers of garlands on the part of many commuters on their way home are common experiences. Crowded places and narrow passage ways with pedestrian traffic are magnets for beggars to do their trade. The garbage disposal problem attracts very poor people toward an informal industry of recyclers often including pools of school age children to form the army of workers at the grass roots level. These are the people who inevitably get entrapped into the dregs of the labor pile. These manifestations of excess labor are stark images of poverty.

It is possible to estimate a relationship in which the supply of labor depends on the wage at which labor is willing to sell its services. A supply of labor that responds strongly to the wage rate indicates a positive relationship. But if there are laborers who are willing to

accept the going wage rate, then there would be no rise in the wage rate. Thus, the supply of labor is postulated on its relationship with the level of the wage rate that workers accept when they work in a firm.

II. Modeling the supply of labor

Estimating the aggregate labor supply schedule in industry provides an important window toward understanding the nature of the Philippine labor market. Recently available detailed data on labor employment and the corresponding wage bills of the respondent firms (and establishments) make it possible to estimate the supply of labor. Based on judgment about the data, its spread and scale among the various firms in the population, fitting a *linear* model in the data is most appropriate.

If labor offered in employment is dependent on the wage rate that is paid to the worker, then a simple representation of this relation is to fit a regression model to firm data on amount of labor supplied and the wage paid to workers. In each firm i , the amount of labor offered depends on the wage rate paid to workers, as follows:

$$Labor_i = g(Wage_i, \text{a vector of } X_{ij}, e_i)$$

where *labor* is total labor (measured in man-years of employed labor) in the firm, *wage* the annual wage rate paid to the workers of the firm, and e the usual stochastic error term. In addition, a corresponding vector of attributes X_{ij} associated with the firms in the sample (to be explained later).

Two models are presented to estimate this relationship. The first model uses the quantity of labor measured in man-years and makes it depend on the annual values of the wage bill and on the average annual wage rate of employed labor. In general, labor would be expected to respond to a rising wage rate. It appears natural to expect that the amount of labor hired is directly related to a rising wage bill. A second wage supply model drops the wage bill and calculates the relationship of the quantity of labor mainly on the wage rate which paid to labor. The second model is the usual expectation about the relationship between labor employment and the wage rate.

The difference in the two models is the inclusion of the wage bill as an explanatory variable. For *Model I*, a linear regression is estimated for observations involving i firms for data on labor in man-years, the wage-bill of the firm, the average wage rates of labor in the firm, a vector of special characteristics, and an error term:

$$Labor_i = g(Wage_Bill_Total_i, Wage_Rate_i, \text{a vector of } X_{ij}, e_i).$$

And for *Model II*, the following is estimated where the wage bill, as stated, is dropped as an explanatory variable:

$$Labor_i = h(Wage_Rate_i, \text{a vector of } X_{ij}, e_i).$$

In fitting a linear regression model of this type, the outcome in the value of the coefficients has the following theoretical expectations. If labor is *strictly* scarce, the signs for the coefficients of total wage bill and for the wage rate would be positive, whether one is examining *Model I* or *Model II*.

If labor is in the *unlimited* supply zone, the coefficient for the wage bill would still be positive for the reason that any increase in the hiring of labor by the firm would have to be matched at least by provisioning for the pay of the wages of any additional hires. The wage bill is the product of the amount of labor services hired and the wage rate of labor. The matter of the slope coefficient for the wage rate coefficient would be positive in the normal case. But it could however admit of any value. The coefficients for the wage rate in part could be interacting with the impact of the size of the wage bill in relation to the amount of labor hired. The presence of a consistently low average wage rate as the scale of the firm's hiring of labor rises could lead to a negative value of the wage rate coefficient via the interaction with the impact of the wage bill as an included explanatory variable. Of course, it may happen that the coefficient value could be very small if not zero in value. If labor is in the *abundant* supply zone, the likelihood of the wage rate coefficients having a small positive value can be expected. It would surely be a little more on the positive side than if the supply is in the unlimited labor supply zone.

The expectations about estimates of the regression from *Model II* would be simpler. Here, every thing almost depends on the estimate of the wage rate coefficient which is expected to be positive, if labor is in the strictly scarce labor zone. Otherwise, when labor supply is in the abundant zone of labor, the wage rate coefficient could only be positive but very small in value.

If labor is *unlimited* in supply, the wage rate coefficient is zero in such a regression equation. A poor estimate of the wage rate coefficient suggests the existence of unlimited supply of labor. And a very small value of a positive wage rate coefficient would almost confirm the presence of unlimited supply of labor and certainly, that of an abundant supply.

The introduction of a set of characteristics among the firms in the regression sample could also be helpful in improving the outcome of the regression estimates. For purposes of the very large sample of data used in this study, it is possible to define more carefully different firm characteristics without loss of degrees of freedom. One defining set of characteristics could be in relation to the group of firm sizes that some of the firms in the regression estimation belong to. Those labor supply and the wage rates of the laborers employed among these groups of firms could behave in a particular way as to help in defining the slope coefficients of the wage variables and of course the estimates of the constant of regression. Also, firms belonging to a single industry cluster could have have common and unique characteristics that set them apart from other industries and firms.

In estimating the effects of the various vector of characteristics associated with the firms in the regression samples, the use of dummy variables is employed. Firms that satisfy a particular characteristic are identified and are given a value equal to one; otherwise, the sample firm is given a value of zero. In this way, as many characteristics as used are employed and introduced in the regression estimation. The impact of these characteristics is on the value of the constant of regression, as explained in the discussion below.

III. Data basis of the study

The Survey of Manufacturing is a long standing statistical work of the Philippine government. The reports of these annual surveys are summarized in the regular reports of the National Census and Statistics Office. These are the surveys that form the basis of summary statistical reports on industry that are presented, for instance, in the annual Philippine Statistical Yearbook. Because most of the reports are presented in summary form, for many years many of these mine fields of data had not become available for detailed analysis. This study provides a break from this tradition as the use of unit records became available for economic and statistical analysis. The sample data set for the survey consists of about slightly more than 4,800 unit records of firms. This has presented many possibilities for detailed statistical work, giving the analyst greater flexibility in the use and grouping of data.

The survey unit records are based on manufacturing establishments. The survey of manufactures for 2005, which is part of a more comprehensive survey of business and industry in that year, is a component of the integrated economic surveys conducted by the government statistics office. A unit record represents the response of a manufacturing establishment to the survey. A manufacturing establishment is defined as a branch, a factory unit or main office of a business unit. Most establishments are simply firms operating as individual business units. Therefore, reference to “firms” rather than establishments is mainly used in this paper.

The survey seeks various economic data on the operations of business firms in industry. For purposes of this study, the important data used are the amount of labor hired in man-years and the set of wage information that are reported by the firms in the survey. The survey required the respondent firms to provide the amount of gross salaries and wages that the firm pays its employees during the survey year. The gross salaries and wages “refer to payments in cash or in kind prior to any deductions for employee’s contributions” to social security, tax etc. Such a definition includes total basic pay, overtime pay for extra hours worked, vacation and leave benefits pay, bonuses, food and other cost of living allowances, commissions for salaried employees, commutable transportation and representation allowances, and other gratuities, including separation pay. However, only aggregative wage bills, not details, are required as answers to the survey questionnaire. In short, it is a comprehensive wage bill which is reported. The data on number of employed workers provide the basis for directly imputing the average wage rates of workers in the firm. There are no direct responses to these. Because of the diversity of payrolls and the various skills that are often hired in any establishment, one could only hope to arrive at average wages across the personnel of any respondent company. Thus, the data on annual wages are derived by dividing the gross wage bill by the number of workers in the firms.

The surveys identify the main line of manufacturing activity of the respondent firm. The classification of the activity is based on the Philippine commodity and industrial classification system. In various details, these industries could be classified by industrial classification. The respondents were tracked down by as much as four-digit aggregation of the industrial classification. For purposes of the study, it became possible to make a listing

of a few firms belonging to 3- or 4-digit industrial classifications that are identified in the survey.

To generate individual characteristics out of the respondent firms, two classification systems are used in the elaboration of the regression models. The first was to group all the samples by size of the business firms. Ten different groupings by size are used, to be compared against a base or reference group which is the smallest grouping of firms. For this purpose the benchmark group for comparison of size is the group of firms with less than 10 workers. Ten different sizes of firms are then defined from the listing as reported by the firms. The following represent the size groupings (together with the number of observations within the group being enclosed in parentheses):

- Size 1 – Firms with more than 10 and up to 20 workers (number of firms, 467)
- Size 2 – Firms with more than 20 and up to 50 workers (1,305)
- Size 3 – Firms with more than 50 and up to 100 workers (717)
- Size 4 – Firms with more than 100 and up to 200 workers (525)
- Size 5 – Firms with more than 200 and up to 300 workers (306)
- Size 6 – Firms with more than 300 and up to 400 workers (164)
- Size 7 – Firms with more than 400 and up to 500 workers (98)
- Size 8 – Firms with more than 500 and up to 600 workers (134)
- Size 9 – Firms with more than 600 and up to 700 workers (95)
- Size 10 – Firms with more than 700 workers (149).

As for industrial characteristics, the grouping is based on the nature of the industrial activity initially with the use of 3-digit classification as the initial basis. But more than that is done for some groups where the firms are relatively fewer or they belong together in a larger cluster. Some 3-digit groups are further aggregated by linking them by the nature of their product activity. Thus, they form a subset of 2-digit aggregation level of industrial firms. This clustering criterion enabled further industrial grouping while avoiding excessive aggregation. For instance, instead of having one set of food industries – mostly made up of wage goods industries which are designed to sell to the domestic market – five different food industry groups are presented. They are quite heterogeneous when it comes to providing a description of their labor-intensity as industries. A number of industry groups portray traditional import substituting industries. Some are emerging and dynamic sectors of the economy. Some of these are manufacturing industries that predominantly export their output.

The attached table shows the details of the industry groupings, the description of the 3-digit codes of the unit records included in each industry grouping, and finally, the number of observations per industry group. The listing included is comprehensive but it does not include even more important industry groups that deserve their own particular study.

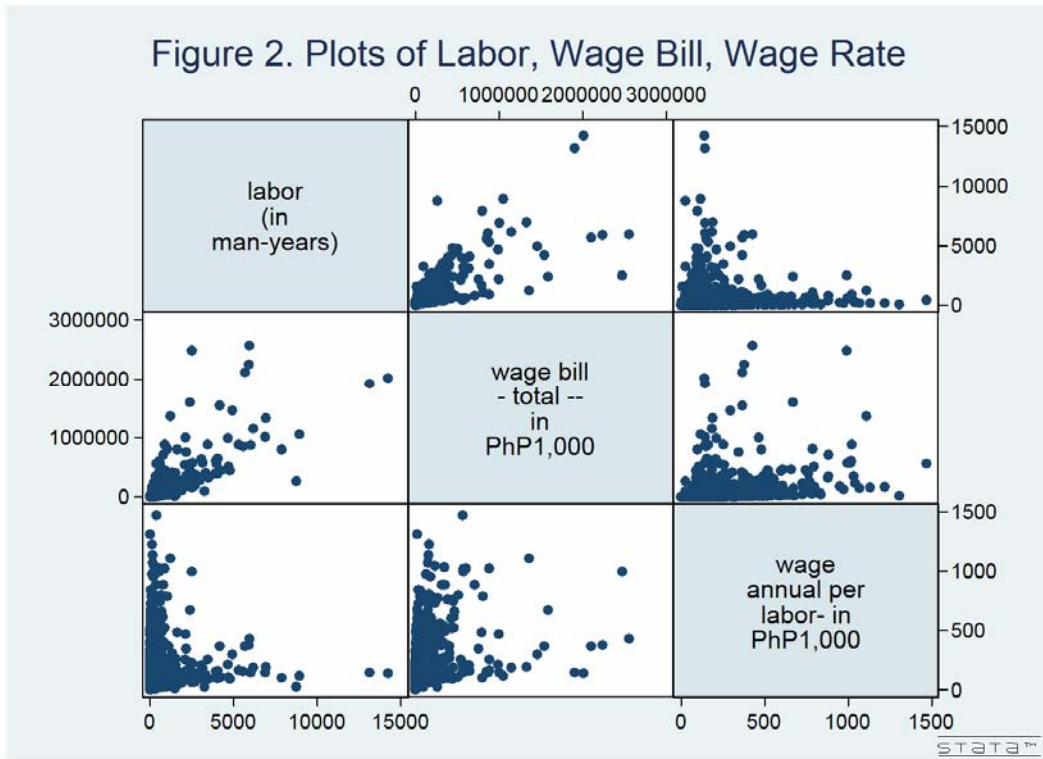
| Industry Group | 3-Digit (PSIC) Codes Included in the Industry Group | Number of Observations |
|-----------------------|--|-------------------------------|
| Food 1 | 151 (Food processing: meat, fish, canning) | 197 |
| Food 2 | 152 (Dairy and cream) | 27 |
| Food 3 | 153 (Rice and corn milling) | 82 |
| Food 4 | 154 (Grain milled products) | 93 |

| | | |
|------------------------------|---|-----|
| Food 5 | 155 (Wine & soft drinks) | 77 |
| Sugar | 156 (sugar cane milling), 157 (muscovado sugar), & 158 (sugar confectionaries) | 325 |
| Textiles and garments | 171 (textile mills), 172 (carpets & cordage), 173 (knits), 174 (embroidery), 181 (men's & boy's garments), 182 (custom tailoring), 183, & 189 (raincoats, hats, gloves, etc.) | 677 |
| Tobacco | 160 (Cigar & cigarette manufacturing) | 16 |
| Electric Lighting & fixtures | 311 (Electrical machines, switches), 312, 313, 314, 315 (Lighting equipment), & 319 (vehicle lighting eqpmt) | 129 |
| Semiconductors | 322 | 133 |
| Electronics | 323 (TV etc.), 324 (sound, transmitters, radios) | 48 |
| Automotive assembly | 341 (motor vehicles, body, assembly), 342 (transport vehicles) | 39 |
| Shipbuilding & repair | 351 | 38 |
| Motorcycles | 359 (motorcycle engines, parts, body, assembly) | 48 |
| Wood processing industry | 201 (veneer, plywood, lumber, wood carving), 202 (rattan furniture, canes) | 131 |
| Furniture from wood | 360 (furniture made from wood) | 192 |
| Miscellaneous manufactures | 391 (jewelry), 392 (pianos, musical instruments), 393 (sporting goods), 394 (dolls and their garments), 399 (small miscellaneous mfg, not elsewhere classified) | 105 |

IV. Econometric evidence on the supply of labor

The results of the econometric work are described in this section. As a preliminary, a matrix plot of the three major variables in the study is presented in Figure 2. These plots of data from the unit record of surveys show total labor employed in the firm, the corresponding wage bill, and the average annual wage rate of workers. The plots do not give any encouragement by way of statistical promise in terms of good fit. Although some pattern can be predicted between amount of labor employed with the wage bill, there is no hopeful pattern of relationships that is conveyed between labor supplied and wages.

It is precisely this weak pattern of relationship that needs to be explored to give strong evidence of the presence of unlimited labor supply. Therefore, instead of giving discouragement, such a pattern of data representation presents interesting econometric challenges and the results have strong economic explanations. Through a number of techniques to introduce specific characteristics of the firm samples, it is useful to search for some regularity even in the pattern of weak relationships.



The supply of labor regression estimates

Table 1 shows the estimates for the two models of labor supply using the total data in the aggregate.

As initial point of caution, it is important to bear in mind the unit of calculation for wages. This has to be borne in mind in order to gain a perspective on the actual magnitude of the coefficient estimates reported in these tables. The unit of calculation in using the wage values have been rounded off to PhP1,000. All these numbers – the wage bills and the wage rates on an annual basis – are on the right hand side of the equation while the dependent variable is measured in labor man-years. As a result, the resulting regression coefficients appear much larger when related to the PhP1,000 value. But to get dimensions sensitized to their peso unit values, all the coefficients associated with the wage units need to be divided by 1,000. Thus, the estimated coefficients estimates are really a thousandth time smaller. So long as this is kept in mind, it would be easy to agree with the discussion below. But for those who would need some direct convincing, a coefficient number estimated as 0.06 (for wages configured in PhP1,000 units) is really to be read as 0.00006 (when measured in terms of the peso unit). Thus, the estimate in question is really close to zero.

Table 1. Supply of Labor in Philippine Industry—Summary Results

Dependent variable: Total Labor hired (in man-years)

| Variable | Model I | Model II |
|----------------|--------------|------------|
| Wage bill | 0.0040206*** | |
| | 0.000046 | |
| | 0.0000 | |
| Wage rate | -1.0952*** | 0.72569*** |
| | 0.049366 | 0.073545 |
| | 0.0000 | 0.0000 |
| _Constant | 189.06*** | 116.08*** |
| | 7.3057 | 11.927 |
| | 0.0000 | 0.0000 |
| R^2 adjusted | 0.63746 | 0.020997 |
| rmse | 355.95 | 584.92 |

legend: b-coefficient/standard errors /probability
significance level: * p<0.05; ** p<0.01; *** p<0.001

The wage bill coefficient in *Model I* is a positive number. It is significant statistically but it is also very small and almost close to zero. When calibrated to unit pesos, the wage bill coefficient is 0.000004 (!). This means that the wage bill is not a magnitude of great consequence in determining the level of the amount of labor that is offered to industry. Although there is a positive direct dependence, a large rise in the wage bill indicates a large size of labor employed in the industry. In this context, the wage bill almost represents a

rising indicator of size of the firm in terms of employment. Large firms with large wage bills indicates an increasing amount of labor employed, but the impact of this through the estimated coefficient is of little magnitude.

The wage bill is but arithmetically the size of the labor employed multiplied by the average wage rate. If employment is rising but the size of the wage bill is not rising as fast, then the wage rate is essentially not rising commensurately with the rise of the total payroll. In fact, it could even be so that the average wage rate (at least in relation to other firms with a lower employment size) is lower for these larger firms. In fact, it could simply indicate that more and more low-wage rate employees are getting hired as the company size rises. This is of course what can be expected when most companies get large workers in numbers to take advantage of low wage labor. Large companies can hire as many workers and there is a supply of workers willing to offer their services at the going wage rate. This happens of course in a situation where there is insufficient aggregate labor demand that could help to push the labor supply market toward tightness of supply. This explains why the estimated wage bill coefficient is very small and is almost close to zero even if it is positive in value.

The coefficient for the wage rate is negative. The expected value of the coefficient for the wage rate is a positive number if the labor supply is scarce. But a negative value of the coefficient is acceptable in the context of a model that has the wage bill also as an explanatory variable. A negative value of the wage coefficient could be explained in economic terms. A wage bill could rise to explain an ever rising level of manpower in a firm even in the case where the average wage rate falls or does not rise. Companies that employ a large amount of workers in labor intensive activities would pay relatively low average wage rate per employee in relation to a large wage bill. (In fact, this might be the reason for their entry into a market as producers, if they are attracted by the low level of wages, in order to perform their labor-intensive operations.) This can only happen if labor is quite abundant or unlimited in supply because workers offer their services at the going wage rate that is determined by the overall labor market.

Model II, as already stated, estimates the labor supply simply as a function of the wage rate. The offer of labor to the firm therefore is tantamount to the quantity of man-years of labor that the firm hires as a function of the annual wage rate. A positive coefficient for the average wage rate signals at least a direct relationship of labor to the amount of labor hiring that workers satisfy with their offer of employment. Although the estimated coefficient is positive, its value is also very small. In this sense, the wage rate is not a major factor in the offering of labor for employment because it is quite abundant.

But it is an employer's market that makes it possible for workers to offer themselves for work at the going wage rate. The annual wage rate has a very limited contribution to the labor that is hired.

In *Model I*, the adjusted R^2 is quite high. This means that much of the variation in the total amount of labor supplied is explained well by the wage bill and the average wage rate. But in the case of *Model II*, the average wage rate offers little in the amount of providing a high adjusted R^2 . This means the essentially, it is the wage bill that accounts for an

explanation of much of the adjusted R^2 so that variation in the wage rate really explains much about the nature of the employment in industry.

Summarizing up to this point, these estimates of the coefficients associated with the wage rate which are very small even when significant statistically confirms something important about the labor market. The Philippine labor supply is predominantly within the range of unlimited and abundant zones of labor supply. In fact, the labor supply behavior almost takes on the characteristics of a labor market that is in the zone of the unlimited supply of labor.

Within this zone, labor supply that is offered for work would grab any job offer at the going wage as the availability of substitute supply threatens that prospect of employment. Labor that is in this market is wary about the nature of the substitute supply of labor. Even if a positive wage rate coefficient is present, the magnitude of that supply is also quite low. For the most part, the country could be said within the abundant zone of labor if not in the zone of unlimited labor.

The supply of labor and firm size characteristics

Table 2 shows the estimates of the labor supply model that takes into account the effects of group size of the enterprises. All these estimates provide a comprehensive statement about the supply of labor in industry taking into account specific size and industry characteristics of many of the firms included in the sample.

Table 2. – Supply of Labor and Firm Size Characteristics

Dependent variable: Total Labor hired (in man-years)

| Variable | Model I | Model II |
|-----------|------------------------------------|-------------------------------|
| Wage bill | .0027401*** .00004719 0.0000 | |
| Wage rate | -1.0191*** .042964 0.0000 | .021778 .051679 0.6735 |
| Size 1 | 41.908 18.362 0.0225 | 10.542 24.293 0.6644 |
| Size 2 | 74.87*** 15.014 0.0000 | 27.279 19.843 0.1693 |
| Size 3 | 121.55*** 16.803 0.0000 | 65.687** 22.204 0.0031 |
| Size 4 | 189.78*** 18.25 0.0000 | 137.11*** 24.126 0.0000 |

| | | | |
|--|--|------------------|------------------|
| Size 5 | | 260.82*** | 236.57*** |
| | | 21.367 | 28.276 |
| | | 0.0000 | 0.0000 |
| Size 6 | | 315.07*** | 340.07*** |
| | | 26.437 | 34.987 |
| | | 0.0000 | 0.0000 |
| Size 7 | | 374.76*** | 446.44*** |
| | | 32.139 | 42.508 |
| | | 0.0000 | 0.0000 |
| Size 8 | | 445.71*** | 589.21*** |
| | | 28.561 | 37.662 |
| | | 0.0000 | 0.0000 |
| Size 9 | | 560.1*** | 821.04*** |
| | | 32.996 | 43.266 |
| | | 0.0000 | 0.0000 |
| Size 10 | | 1433.2*** | 2450*** |
| | | 32.385 | 36.056 |
| | | 0.0000 | 0.0000 |
| Constant | | 43.788*** | 3.9781 |
| | | 12.616 | 16.674 |
| | | 0.0005 | 0.8114 |
| R^2 adjusted | | 0.76101 | 0.58132 |
| rmse | | 289 | 382.52 |
| legend: b-coefficient/standard errors /probability | | | |
| significance level: * p<0.05; ** p<0.01; *** p<0.001 | | | |

The sample size of the firm records is large – 4,800 firms. It covers the full diversity of industrial establishments in the country. An investigation into the effects of firm size is therefore useful to help isolate in influence of the size characteristics of firm groupings as a factor in the two models of labor supply. All the firms are grouped into 10 sizes by size of total employment, with *Size 1* grouping all firms with up to 10 employees. The largest of these sizes (*Size 10*) are firms with more than 1,000 employees.

By introducing the firm size of the group into which the industrial firm belongs, the supply of labor estimates improve. All the size characteristics are dummy variables and their impact is on the constant term of the regression (which still continues to be significant statistically). Each size characteristic adjusts the level of labor through the impact on the size of the constant term. The impact of the size characteristics reveals that the amount of labor that is hired does not enter as a significant factor in the supply regression except as it affects the value of the regression constant. But coefficient for size of the group is very highly significant in most of the cases of firm sizes. But such coefficient estimates only adjusts the level of the regression constant.

The major finding from these regressions is that firms belonging to particular sizes of employment have a high degree of homogeneity in terms of explaining their impact on the supply of labor. Their main effect – as judged from the statistical significance of the dummy variables representing the sets of firms satisfying a particular employment size criterion – is to adjust the value of the constant term. Because the benchmark for the size is the smallest group of firms (as already indicated, firms with up to 10 workers), all the size characteristics indicate a rising impact on the constant term of the supply regression.

Effects of special industry characteristics

Table 3 summarizes the estimates showing the characteristics of the specific industry groups to which the firms in the sample belong.

Table 3 – Supply of Labor and Special Industry Characteristics
Dependent variable: Total Labor hired (in man-years)

| Variable | Model I | Model II |
|-------------------|--------------------------------------|---------------------------------|
| Wage bill | 0.0039475*** 0.00004632 0.0000 | |
| Wage rate | -1.0954*** 0.050243 0.0000 | 0.6658*** 0.074165 0.0000 |
| Food 1 | 4.238 26.168 0.8714 | 91.848* 42.346 0.0301 |
| Food 2 | -126.18 68.68 0.0663 | -70.344 111.22 0.5271 |
| Food 3 | -115.31** 41.688 0.0057 | -78.115 67.508 0.2473 |
| Food 4 | 26.473 37.425 0.4794 | -41.956 60.594 0.4887 |
| Food 5 | 10.731 41.535 0.7961 | -34.952 67.26 0.6033 |
| Sugar | -37.609 21.214 0.0763 | .9653 34.347 0.9776 |
| Textiles&Garments | 69.266*** | 123.23*** |

| | | | |
|-------------------|--|-----------|-----------|
| | | 15.669 | 25.355 |
| | | 0.0000 | 0.0000 |
| Tobacco | | 70.943 | 428.34** |
| | | 88.274 | 142.8 |
| | | 0.4216 | 0.0027 |
| Electrical~g | | 144.74*** | 252.87*** |
| | | 32.126 | 51.986 |
| | | 0.0000 | 0.0000 |
| Semiconductors | | 253.3*** | 751.8*** |
| | | 31.966 | 50.894 |
| | | 0.0000 | 0.0000 |
| Electronics | | 165.48** | 152.66 |
| | | 51.283 | 83.05 |
| | | 0.0013 | 0.0661 |
| Automotive | | -73.833 | 26.79 |
| | | 58.267 | 94.342 |
| | | 0.2052 | 0.7764 |
| Shipbuilding | | -51.569 | -60.347 |
| | | 60.727 | 98.346 |
| | | 0.3958 | 0.5395 |
| Motorcycle | | -76.425 | 37.328 |
| | | 54.127 | 87.653 |
| | | 0.1580 | 0.6702 |
| Wood processing | | -14.58 | 6.5707 |
| | | 31.677 | 51.299 |
| | | 0.6453 | 0.8981 |
| Furniture: wood | | 1.2845 | 15.959 |
| | | 26.625 | 43.118 |
| | | 0.9615 | 0.7113 |
| Miscellaneous mfg | | -16.77 | -1.4868 |
| | | 35.803 | 57.98 |
| | | 0.6395 | 0.9795 |
| _Constant | | 174.49*** | 70.813*** |
| | | 9.3613 | 5.032 |
| | | 0.0000 | 0.0000 |
| R^2 adjusted | | 0.64671 | 0.073447 |
| rmse | | 351.37 | 569.04 |

legend: b-coefficient/standard errors /probability
significance level: * p<0.05; ** p<0.01; *** p<0.001

Further elaboration of the supply of labor requires taking into account the characteristics of special industries. Several industry groups are isolated and introduced into the supply of labor equation. This approach gives a measure of the interrelation of the supply of labor equation with specific industrial groups. The industries chosen – at the specific level of aggregation – includes five types of industry groups and also some established old line manufacturing as well as new, dynamic sectors that are mainly operating in the export sector. Other sectors studied include sugar processing, textiles and garments, tobacco manufacturing, electrical goods manufacturing, semiconductors, electronics, shipbuilding (repairs and boats), motorcycle manufacturing, automotive manufacturing, wood processing, furniture making out of wood, and a variety of catch-all miscellaneous manufacturing (most of these are new types of manufacturing that have not yet found a place in the classification system so that they fall under a category of “not elsewhere classified.”).

This is not an all inclusive picture. But it is a wide and somewhat specific view of the industrial sector. It includes old line types of very small firms in wage goods industries and high employment industrial establishments. These industries cover some basic manufacturing of consumption goods of the people (mainly wage goods), of capital goods manufactured or assembled locally, of luxury consumption items nurtured under the industrial policy regime of import substitution but now restructured as a result of the opening up of the economy through import competition, and new and old lines of export industries that are competitive industries at the international level. Thus, the industries represent the main line of industrial activities that have thrived in the past, including new and dynamic industries mainly destined for the export markets. All in all, they give a good picture of the variety of the Philippine manufacturing sector at this point in time.

The estimates for *Model I* do not show any improvement. In fact, the estimates are worse compared to the estimates for the supply of labor when the only other characteristics taken into account are based on size of the firm groupings. Of the five food groups, only two industry groups had statistically significant estimates, but only *food3* (rice and corn milling) is relatively highly significant among these. Among the other industries with significant coefficient estimates for the dummy variables are *textiles & garments*, *electrical machinery*, *semi-conductors*, *electronics*, and weakly, *sugar*.

The estimates for *Model II* containing only the wage rate as the major explanatory variable do not improve the supply estimates. Only *textiles*, *tobacco*, *electrical manufacturing*, *semiconductors*, *electronics*, and *food1* have statistically significant coefficient estimates. Even more so, however, the adjusted R^2 estimate is extremely low.

An interesting and important phenomenon is seen from the *Model II* regression involving the industry group characteristics. The wage rate is statistically significant at a high level, indicating a supply response to the wage rate. Also, industry groups covering *textiles*, *tobacco*, *electrical lighting*, and *semiconductors* have statistically significant dummy coefficients. These are industries that have access to large labor force supplies since they are dominated by firms with large employment size. Some of these firms form the vanguard of industrial export manufacturing firms that include foreign direct investments. At the same time, some include firms that substantially serve the domestic market

manufacturing goods designed for the consumption needs of the working man – in short, wage goods.

If statistical significance standards are further relaxed to include those industries in which the standard errors have at least 10 percent probability level – which is quite low as tolerance standard for regression estimates – this could include other firms in the *electronics* industry groups and some wage goods industries like tobacco, and *food1* (food processing, including meat and fish canning). These are firms that that could feel the stress of policy issues arising from wage rates that affect the labor market.

These results are not surprising. Wide error terms are associated with the observations of labor employed, wage bills and wage rates in these industries. The problem essentially arises from the great heterogeneity of the industries based on their labor size. Most of the firms in the sample are small firms. The baseline group of firms (Size 0) is the smallest: firms with less than 10 employees. Size 1 of the firms consists of workers with more than 10 to 20 workers. Both these types of firms were only sampled for purposes of the survey. The unit observations were not blown-up units to conform with their predicted contribution to the size of the manufacturing sector. For this reason, the regression results are even slightly biased for the larger sample size of firms. The cluster of small firms employing up to fifty employees is very large. The largest of these firms in that group account for the 3,023rd firm of 4,494 firms. This firm then is the 67th percentage point in the population of firms. But raise the classification criterion to with up to 200 workers and 79 percent of the firms are covered. Thus, firms having more than 200 workers make up only about 20 percent of the total number of firms in the sample.

It is therefore important to segregate the firms by clusters and then determine whether much more can be said about the supply of labor estimates involving the various industry groupings that have been chosen for study. This is done and the results are reported in Table 4 only for *Model II*. In undertaking these regressions, the very small firms are eliminated from the samples used in the regression. (These estimates from Table 4 can be compared with the *Model II* estimates for the total sample of firms as shown in Table 3.) The cut-off of 50 workers is used for inclusion in the regressions involving firms with up to 200 workers. A second group of firms having more than 200 to 500 workers are grouped together. Finally, all the large firms are grouped as firms with more than 500 workers. As the outcomes of these regressions show, some of the industry characteristics do not add any improvement to the estimates of the labor supply.

Table 4 – Supply of Labor: Model II, By Specific Industry Groups with Firm Size Restricted to Employment Size

Dependent variable: Total Labor hired (in man-years)

| Variable | Firms with 51 to 200 workers | Firms with 201 to 500 workers | Firms with more than 500 workers |
|-----------|-------------------------------------|-------------------------------------|--|
| Wage bill | .038344*** .010007 0.0001 | 0.0034911 .024431 0.8864 | -0.033578 .53012 0.9495 |

| | | | | |
|--------------------|--|-----------|----------|----------|
| Food 1 | | -3.2381 | 2.3529 | 25.35 |
| | | 5.1462 | 18.599 | 389.85 |
| | | 0.5293 | 0.8994 | 0.9482 |
| Food 2 | | 45.373 | 28.846 | - 907.51 |
| | | 18.413 | 35.528 | 775.69 |
| | | 0.0139 | 0.4172 | 0.2428 |
| Food 3 | | -30.217 | -9.3649 | 0 |
| | | 18.413 | 83.524 | 0 |
| | | 0.1010 | 0.9108 | . |
| Food 4 | | 7.4738 | -27.746 | -684.96 |
| | | 7.4822 | 18.787 | 657.12 |
| | | 0.3181 | 0.1403 | 0.2979 |
| Food 5 | | -10.806 | -14.22 | -928.42 |
| | | 7.6692 | 31.959 | 796.51 |
| | | 0.1591 | 0.6565 | 0.2445 |
| Sugar | | -6.3406 | 15.195 | -404.06 |
| | | 5.4071 | 15.19 | 417.92 |
| | | 0.2412 | 0.3176 | 0.3343 |
| Textile & Garments | | 0.3089 | 14.2 | -368.86 |
| | | 3.499 | 9.9753 | 229.29 |
| | | 0.9297 | 0.1552 | 0.1086 |
| Tobacco | | 4.2765 | -49.258 | -440.74 |
| | | 20.583 | 59.129 | 570.94 |
| | | 0.8354 | 0.4052 | 0.4406 |
| Electrical~g | | 3.9713 | -2.1658 | 1234.8** |
| | | 6.0365 | 19.374 | 429.95 |
| | | 0.5107 | 0.9110 | 0.0043 |
| Semiconductors | | 20.217* | 54.02*** | 227.9 |
| | | 8.7103 | 15.45 | 250.56 |
| | | 0.0204 | 0.0005 | 0.3637 |
| Electronics | | 20.077 | 83.728** | -660.8 |
| | | 11.085 | 29.959 | 478.53 |
| | | 0.0703 | 0.0054 | 0.1682 |
| Automotive | | -5.5114 | -20.061 | -509.56 |
| | | 13.074 | 59.134 | 717.62 |
| | | 0.6734 | 0.7346 | 0.4781 |
| Shipbuilding | | -34.408** | 65.661 | 0 |
| | | 13.085 | 37.747 | 0 |
| | | 0.0087 | 0.0825 | . |
| Motorcycle | | 22.958 | -45.99 | -939.77 |
| | | 20.578 | 41.984 | 797.04 |
| | | 0.2648 | 0.2738 | 0.2391 |

| | | | | |
|--|--|------------------|------------------|------------------|
| Wood processing | | -6.0454 | -8.4805 | -57.976 |
| | | 6.9607 | 30.048 | 657.22 |
| | | 0.3853 | 0.7779 | 0.9298 |
| Furniture: wood | | .34309 | -4.4609 | -549.81 |
| | | 5.3699 | 17.639 | 495.84 |
| | | 0.9491 | 0.8004 | 0.2682 |
| Miscellaneous Mfg | | -7.1037 | -30.473 | -710.28 |
| | | 7.9377 | 20.979 | 714.14 |
| | | 0.3710 | 0.1469 | 0.3206 |
| _Constant | | 98.031*** | 304.19*** | 1521.9*** |
| | | 2.1721 | 7.2016 | 190.5 |
| | | 0.0000 | 0.0000 | 0.0000 |
| R² adjusted | | 0.02674 | 0.02816 | 0.026146 |
| rmse | | 41.004 | 83.277 | 1557.1 |
| legend: b-coefficient/standard errors /probability | | | | |
| significance level: * p<0.05; ** p<0.01; *** p<0.001 | | | | |

The results shown in Table 4 uniformly indicate even poorer estimates from a statistical viewpoint. This affirms the findings already stated concerning the effects of industry characteristics. After making the sample of firms relatively homogeneous by restricting the groupings of firms according to some firm size criteria, the outcome of the supply estimates do not yield any single pattern except that of poor statistical results.

Only firms in the small to medium establishments have a significant wage rate. This rate when calibrated to the unit peso measurement of the wage rate is very small. In the case of firms with 51 to 200 workers, this is 0.000038, which is quite small. Only *semiconductors*, *shipbuilding & repair*, and the regression constant met the criterion of statistical significance of 5 percent. However, a much more generous level of the level of statistical significance – for instance closer to 15 percent is it possible to consider *food 2*, *food 3*, and *food 5* in this grouping of firms. Among the firms in the class of 201 to 500 workers, the wage rate coefficient is not significant, and only *semiconductors* and *electronics* have statistically significant industry characteristics. Only *food 4* and *textiles & garments* have estimates that come closer to a very weak level of significance of 15 percent. In the case of the large firms (more than 500 workers), the regression fit is uniformly poor. However, *electric lighting and fixtures* has a significant coefficient estimate.

V. Discussion: Labor supply in industry and the wage rate

How are these statistical results to be interpreted? Workers offer their services to the firms for the wage rate at which there is a job opening. The worker when employed could stay in that wage rate essentially for a long time, except as wage differentials and wage productivity often improves the prospects of wage increase. But if that wage rate does not rise sufficiently over time, it is a sign that there is a lot of competition from other laborers

who are waiting to be employed. This is also a sign that firms do not as a rule find investments in productivity increasing capital improvements because laborers at low wages are infinitely available. In a scarce labor market, the turnover of those employed to find jobs elsewhere often causes a rise in the wage rate. A labor supply schedule that is not sustained by a positive coefficient for the wage rate (or which is only very low in value such as that estimated in this study) indicates the presence of an army of unemployed. Thus the labor market is an employer's market. Jobs are very scarce and there is a lot of available labor for any job opening.

In such a setup, the wage rate is simply exogenously determined. Laborers take the wage rate as the given and offer their services at that wage which they accept without question. In an abundant labor situation, the wage contracts would be guided by government policy regarding wages, such as the minimum wage. At another level, aggregate demand for labor arising from macroeconomic policies dominate.

The going rate for skill differentials would be determined by the employer referencing market conditions that enable them to hire labor at the going rate. The community going wage or some other standard that is prevalent for the industry would matter most in the wage setting. However much the worker might desire a higher wage rate, the abundance of competing labor does not provide the worker with wage bargaining strength. In short, the firms can hire as many workers as they need them. They are simply constrained by their own demand for labor.

Figure 1 is now recast in terms of the regression results in terms of Figure 3. As one might discover, Figure 1, and also Figure 3, both have the wage rate measured on the vertical axis and the amount of labor on the horizontal axis, as is usually done in textbook presentation of supply and demand involving the labor market. The constant term of the regression therefore is marked on the horizontal axis, and its value on the x-y plane is shown vertically. The size characteristics of the firms which are, as dummy variables, amendments of the intercept or constant term (C_0), are also marked on different segments of the horizontal axis that measures the amount of labor hired. The size characteristics are illustrative and are marked S with a corresponding subscript (randomly picked) and the industry characteristics are marked I similarly. They are placed in the figure only for illustrative purposes. The indicators are randomly picked based on the groupings of firm in particular sizes and in specific industries. To make these patterns of regression lines about the intercepts look more in conformity with the regression results, they would *not* be exactly perpendicular to the horizontal axis but slightly tilted to the northwest by the tiniest of slopes (when the wage rate explanatory variable has a statistically significant slope coefficient; this however, is an infinitesimal positive number, just above zero.)

The individual effects of firm size are shown on the axis for labor amount. Workers offer to work in the small firms as shown by the adjusted constant term. The wage at which workers are employed could be seen from the range of potential wage rates that workers receive and that can be read on the wage rate axis.

The average wage rate is a broken thick line drawn from the vertical axis. The spread around the mean is heavily clustered in an unsystematic manner around the low

wage rate and low employment size (around the regression constant). The average therefore does not provide a reliable reading as a wage statistic. The observed wage rates and employment levels of the various firms are more clustered toward a level that is below the average, closer to the minimum wage rate, which is the guiding wage rate for most types of low end jobs. But larger firms with diverse characteristics have wages that are spread far from the average. However, the annual wage rate of workers with higher levels of skills is pulled down by the effective regional minimum wage (converted to annual basis).¹

Figure 3 is a stylized freehand reconstruction of the cluster of firms showing the plot of labor employed in the firms and their corresponding average annual wage rates (see the plot in Figure 2.) There are three disparate clusters that make it difficult to get good fits for the regression equation for the supply of labor when they are treated as one whole cluster. Most of the firms are clustered in the small dark concentration of firms about the mean where the regression constant passes. This area is also coincidental with the presence of another cluster of firms where the average wage appears to be quite high and disconnected with the overall framework of average wage rates in the industrial sector. These firms require some explanation. The third cluster typifies the situation of firms that have large amount of work force. These are the labor intensive firms and many of them are either wage goods industries with large economies of scale or export-oriented industries in the industrial sector.

¹ Make a note here on what constitutes the minimum wage when the mean wage as given in the measurement is PhP_____. (from the summary table). Note- the summary table gives the means and the standard deviations as well as the min-max values.

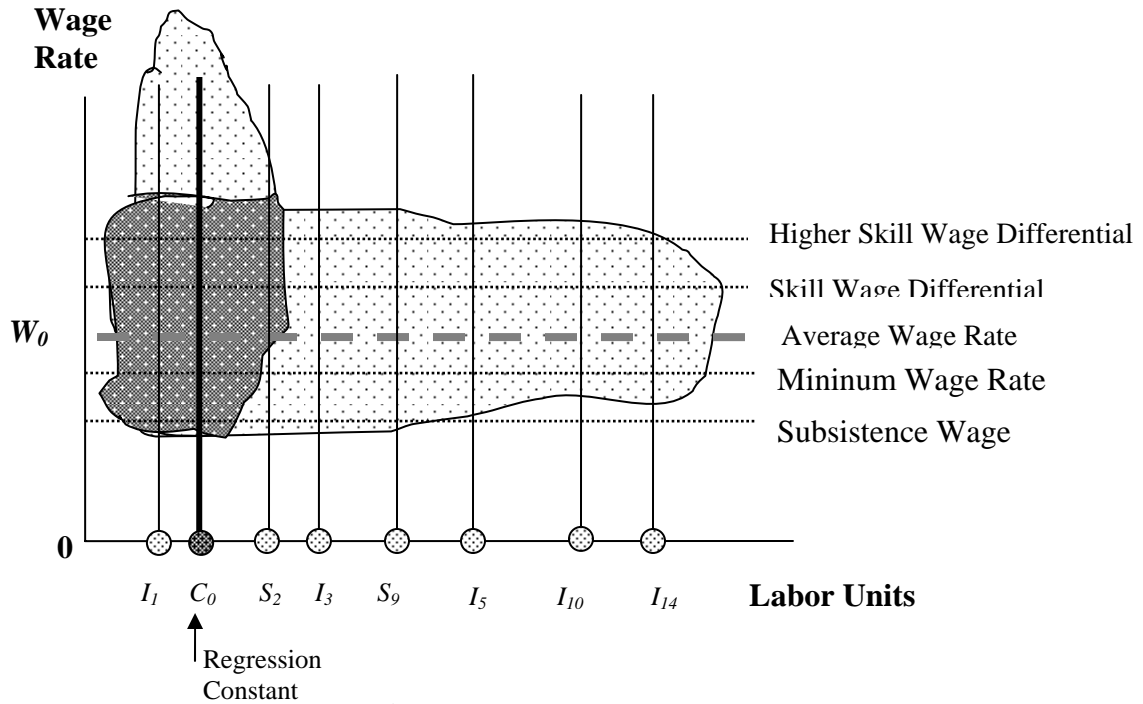


Figure 2

The minimum wage applies to workers in industry and agriculture. The wage rates for industry are higher than for agriculture. But the minimum wage is a mandatory requirement for industry to follow. The benchmark for the minimum wage is that for the Metropolitan Manila region which includes the major cities and towns that are clustered around Manila. In setting their wage rates, other regions often look to the rates in effect for Metropolitan Manila (after hearings are made to determine the level of the wage rate in relation to the cost of living and other factors). There are around 15 administrative regions that have distinct regional wages but that in general, they are clustered together. It is possible to draw these imaginary lines measuring the various mandated wage rates by regions from the wage axis. But that clutters the figure unnecessarily.

A wage rate line that is below the minimum wage line could be imagined to occur in this figure. This might be called “subsistence” wage. But in terms of the data represented in this study, it is less likely to be tracked on the basis of the data used in the study. No respondent firms would probably report their wage payments so that they fall below the minimum wage rate standards. Errors that occur because of untruthful survey answers are the inevitable risks of surveys. The assurance that respondents would not be investigated for their responses does not remove the fear of potential investigation.

The plot of wage rate for any firm with specific labor units hired could be anywhere along the supply of labor that is defined by the regression constant. The average wage rate for the groups of firms in the total population of firms subject to the regression form a cluster without any definite pattern suggesting any relationship between wage and supply of labor: the clusters focus on the average wage which of course are around the constant of the

regression. When the size characteristics of the firms are taken into account, the cluster of relevant firms partly shifts to redefine the regression constant (since most of these have come out statistically significant). Since the constant of the regression is measured in terms of man-years of labor units, the result helps to emphasize the amount of workers within the size groupings that firms in this group avail of, along the average wage rate in which workers offer their services to the firms. In short, workers offer to work at the prevailing or institutional wage rate that firms pay to meet their labor requirements. Wage rate determination is not an active process of interaction between the labor supply and the firm that has the labor requirements.

Such a pattern is most likely to be the case among the firms with small sizes of worker demand. The cluster of workers is thickest among the small firms because they are plentiful in the population of firm observations. The typical manufacturing firm is small scale and therefore it requires a few workers. The median firm is found in the class of firms having less than 10 to 50 workers (*Sizes 1 and 2 plus the baseline group of the smallest firms*). The largest of the firms having 50 to 100 workers (*Size 3*) represents more than two-thirds of the population manufacturing firms. The supply of labor here is represented closest to the constant of regression revised which is associated with the lowest possible wage rate paid. For such workers the average wage rate within these groups of firms would be institutionally linked with the minimum wage. But the floor wage for the smallest of the firms (which include informal manufacturing establishments having live-in workers or piece rate workers) could even be lower than that minimum wage and could be closer to the subsistence wage depending on the wage contract arrangements between the firms and their workers. Thus, the small sized firms would be governed by the wage rates prevailing for that that is likely to be much lower level than the average level (in distinction with the minimum wage). In general however, the governing industry standards for the whole industrial sector would likely be above the regional minimum wage, oftentimes adjusted for whatever skill differentials that are associated with the retention of long term workers.

Thus, this discussion reverts back to the original Figure 1. If point **a** (in Figure 1) represents the inflection point for the rising part of the supply of labor, many very small firms are likely to be located within the area of the labor supply to the left of point **a**. This is the within the zone of *unlimited* supply of labor. A small fraction of firms could be those firms that are slightly affected by the wage coefficient however small in number. That is to right of point **a**, but within the zone of *abundant* labor. These are the firms that are more sensitive to the level of the wage rate. These firms however could only be mildly within the abundant labor supply zone. The presence of a lot of unemployed laborers and those who are employed at much lower levels of wages in very small firms who are seeking improved working conditions, including higher pay, in more established and larger firms, are sufficiently large in numbers to help depress the level of wages that the larger firms face in the labor market.

VI. Further discussion: Where tight supply and excess (or unlimited) supply co-exist within industry

The presence of widespread unemployment and underemployment is the starting point of this study. The discussion of labor market issues in the Philippines often focus on the

presence of labor oversupply and a mismatch of jobs with educational output. What this paper does is to attempt to measure the supply of labor in industry using an economically meaningful relationship.

The question to be asked at this juncture is whether excess supply of labor is relevant to the real world of many skills and jobs and wages. The econometric evidence shown in the first part of this paper advances the description of unlimited labor in the Philippine aggregate labor market. It describes an overall condition of jobs wanting to be found by a lot of workers. The lack of a systematic relation between amount of labor employed and the wage rate confirms the existence of excess labor supply. The supply of labor is available at the average wage that is determined outside of the interaction of the firms and the industry but within the larger economy where the equilibrium wage is determined. And it is essentially available without any wage pressures being created on the hiring companies. This is in essence is the meaning of unlimited labor.

In the real world of many skills and different types of workers fitting particular jobs, there are different wages and salaries for different types of skills and occupations. Each one of these specific skills could be thought of as segmented labor markets. Imbalances within the labor market for these skills are the result of peculiar industry characteristics, some involving industries undergoing supply or demand shocks. In a few instances, this might indicate a market failure for the particular industry affecting the labor market.

Wages by occupational groups

A different approach to the subject is to examine the wage differentials among various occupations. There is fortunately a wealth of recent data on wage differentials by occupational groups. The Bureau of Labor and Employment Services (BLES) undertook recently (2006) an integrated survey (known as BITS) of business practices with respect to wage and compensation schemes. The survey is comprehensive. It covers a wide range of enterprises – 24,000 in all. Hence it provides a comprehensive listing of establishments, wider than the coverage of the manufacturing sector. Although the sample of firms covered might have included the same firms in the survey of manufactures, unfortunately there is no way of connecting each unit record with those in BITS.

The BITS survey published a table showing the average monthly rates of identified occupational groups (aggregated at the 3-digit standard occupational classification) working across a selected list of industries at the two digit level of standard industry aggregation. From this long table (Table 1 in the survey derived from the Wages and Compensation Practices segment of the survey), a total of 390 occupational groups are listed with their specific monthly full-time equivalent wage rates in industry groups where particular skills were most needed. The occupations are also tracked according to their standard classification. We sorted this data to rework the listing of occupations, aggregating the occupations across the industry groups and then averaging the various monthly wages recorded in those industry groups over given occupational groups.

Table 5 provides information on average wages for different occupations. In part **A**, four major occupational groups are summarized as follows: (a) managers and supervisors; (b) highly technical and professional skilled employees; (c) highly trained workers with

highly trained mechanical and operational skills; and (d) unskilled workers. Mean wages and salaries per month for each group were calculated together with the corresponding standard deviation around the mean and showing further the range of minimum and maximum wage values. These statistics were originally derived from averages that were already calculated. But there were still many distinctive features. These were in the case of wage and salary differentials on the one hand and variability

Table 5. Occupational Groups and their Average Wages

| Description | No. of occupations observed across firms | Mean | Std. Dev. | Min | Max | Mean-to-Std. Dev. | Multiple of Unskilled Wage |
|---|--|-----------|-----------|-----------|-----------|-------------------|----------------------------|
| | | | | | | | |
| All occupations | 391 | 12,276.99 | 5,670.74 | 5,343.00 | 60,313.00 | 2.165 | 1.62 0.00 |
| All engineers | 62 | 17,922.08 | 6,281.42 | 7,035.00 | 41,305.00 | 2.853 | 2.36 |
| Supervisory positions | 58 | 16,281.79 | 7,943.02 | 7,303.00 | 60,313.00 | 2.050 | 2.15 |
| Skilled workers, highly skilled | 119 | 10,953.83 | 2,537.93 | 7,325.00 | 21,660.00 | 4.316 | 1.45 |
| Skilled workers, lower grade of skilled | 110 | 10,169.53 | 3,241.77 | 6,243.00 | 27,000.00 | 3.137 | 1.34 |
| Unskilled workers | 42 | 7,578.45 | 1,141.17 | 5,343.00 | 10,752.00 | 6.641 | 1.00 |
| More specific occupations | | | | | | | |
| Mechanical engineers | 6 | 16,432.83 | 3,832.39 | 11,622.00 | 21,430.00 | | 2.17 |
| Electrical engineers | 3 | 20,221.67 | 4,478.65 | 16,565.00 | 25,217.00 | | 2.67 |
| Computer engineers | 2 | 20,181.00 | 12,362.27 | 11,086.00 | 29,276.00 | | 2.66 |
| Electronics and telecommunications engineers | 3 | 22,615.00 | 1,481.81 | 21,749.00 | 24,326.00 | | 2.98 |
| Chemical engineers | 4 | 16,836.50 | 4,471.79 | 11,722.00 | 22,133.00 | | 2.22 |
| Civil engineers | 3 | 18,882.00 | 3,333.11 | 15,061.00 | 21,192.00 | | 2.49 |
| Mining engineers | 2 | 23,391.00 | 1,685.74 | 22,199.00 | 24,583.00 | | 3.09 |
| Systems engineers | 1 | 41,305.00 | | 41,305.00 | 41,305.00 | | 5.45 |
| Geodetic engineers | 1 | 20,890.00 | | 20,890.00 | 20,890.00 | | 2.76 |
| Marine engineers | 2 | 16,479.00 | 6,877.32 | 11,616.00 | 21,342.00 | | 2.17 |
| Aircraft engineers | 1 | 60,313.00 | | 18,134.00 | 18,134.00 | | 7.96 |
| Description of Skills and jobs involved | No. of occupations observed across firms | Mean | Std. Dev. | Min | Max | Mean-to-Std. Dev. | Multiple of Unskilled Wage |
| Production supervisors | 30 | 15,613.60 | 3,870.49 | 8,495.00 | 23,941.00 | 4.034 | 2.06 |
| Professional experts: Engineers, Statisticians, etc. | 37 | 19,962.92 | 6,132.05 | 11,086.00 | 41,305.00 | 3.256 | 2.63 |
| Medical doctors, dentists, hospital workers | 6 | 10,051.13 | 4,045.60 | 7,035.00 | 18,134.00 | 2.484 | 1.33 |
| Teaching professionals: all levels of schools | 8 | 13,868.13 | 2,121.84 | 12,039.00 | 18,859.00 | 6.536 | 1.83 |
| Accountants/ Auditors & economists | 10 | 18,428.40 | 5,453.08 | 11,612.00 | 27,932.00 | 3.379 | 2.43 |
| Engineering assistants, aircraft pilots and engineers, technical assistants, quality control inspectors | 41 | 14,502.71 | 9,559.36 | 7.03 | 60,313.00 | 1.517 | 1.91 |
| Technical & sales representatives, appraisers, Skilled workers: Accounting/ Bookkeeping, Clerks, Production workers | 72 | 11,262.65 | 2,617.26 | 7,938.00 | 21,660.00 | 4.303 | 1.49 |
| Cashiers, bill collectors, receptionists, telephor operators | 9 | 10,794.22 | 2,037.84 | 7,999.00 | 14,010.00 | 5.297 | 1.42 |
| Masons, plumbers, carpenters, receptionists | 6 | 8,859.22 | 2,077.92 | 6,243.00 | 11,478.00 | 4.264 | 1.17 |
| Welders, sheet-metal workers, motor, aircraft, marine mechanics, | 27 | 10,607.52 | 3,203.85 | 7,986.00 | 19,948.00 | 3.311 | 1.40 |
| Printing workers, typesetters, compositors, bookbinders, stereotypers | 5 | 10,638.00 | 1,219.42 | 9,747.00 | 12,569.00 | 8.724 | 1.40 |
| Garments, textile workers, shoemakers, tailors knitters, upholstery workers | 12 | 7,492.83 | 801.91 | 6,658.00 | 19,948.00 | 9.344 | 0.99 |
| Metal workers, metal plant operators, chemical & paper plant operators, petroleum refinery operators | 20 | 11,741.50 | 4,639.90 | 7,533.00 | 27,000.00 | 2.531 | 1.55 |
| Electrical industry workers, pharmaceutical machine operators, mechanical wood assemblers, sewing machine operators, plastic industry operators | 19 | 8,976.58 | 2,133.72 | 6,421.00 | 16,571.00 | 4.207 | 1.18 |
| Heavy transport operators and drivers bus drivers, | 4 | 9,313.25 | 1,201.55 | 8,150.00 | 19,948.00 | 7.751 | 1.23 |
| Unskilled workers, except janitors, messenger: and freight handlers | 42 | 7,578.45 | 1,141.17 | 5,343.00 | 10,752.00 | 6.641 | 1.00 |
| Unclassified: Call centers -- customer service representatives, telemarketers | 12 | 12,775.08 | 2,856.81 | 8,003.00 | 17,212.00 | 4.472 | 1.69 |

Derived from: Bureau of Labor Statistics, BITS

Part **B** of the same table shows a more disaggregated set of occupational groups with their average wages, also derived from BITS. Managers and supervisors receive the highest average salaries and wages. This group has high variability in wages and this implies a great difference also in their skills. This can be derived from the standard deviations and the range of the minimum and maximum values of the wages. It is clear that although they receive higher pay, the wages of supervisors differ in many ways too. Pay differentials are determined by industry or firm conditions. They are also shaped by individual factors. The nature of the markets, of overall industry conditions, and individual circumstances affect the wages received.

Professionals and highly technical skilled employees belong to a very diverse group of workers. What generally distinguishes them from other skilled workers is that they have high upward mobility. Many of them eventually move on to managerial and supervisory ranks. Another characteristic is that their skills require high level professional training, involving professional study often in college, special training programs, and on-the-job training. From this group are engineers, business experts, statisticians, lawyers, certified public accountants, and so on. These employees have a wider variation in their salaries and wages. As an illustration, even among engineers, which are tabulated separately and reported with the groupings, there is a wide dispersion of salaries and wages. The range of salaries is quite high. Engineers are employed by all types of industries. They receive much higher pay in the highly capital intensive industries, but they have an impact on Professionals and highly skilled workers enjoy wages that are higher in scale than most other types of workers.

The great bulk of skilled workers – the bulwark of any industry – are the technicians who have specialized knowledge in the running and maintenance of machinery and equipment and who have special operational knowledge of how these machinery function on a day to day basis. These are workers with formal training but such training is often sub-collegiate in level. Many have graduated from vocational schools. Otherwise, most of the skills that they learn are acquired largely at work. Many of these types of work deal with the operations of machinery driven by motor power within the firm or the other accessory activities of complex industrial establishments. (This point is related to the issue of the educated unemployed who are products of the educational system, which is discussed a few paras., below.) These would be equivalent to that of good vocational schools and certainly at least with some years in high school education.

Those in this group of laborers are highly trained mechanics and machine operators who have grown within the enterprise and who have acquired highly specialized skills earned during employment. It is interesting to note that their average wages are not too far different from those of the highly technical workers and that the range of observations even include some workers whose wages exceed those of the highly skilled. Skilled mechanical operators with the highest salaries however work in very capital intensive industries – in the particular case of the outlier with the highest pay, the workers are employed in petroleum refineries. If these outliers are removed from this calculation, the average wage of the workers would fall and the distribution measured by the standard deviation would be

narrower. Technicians within the work force have many job descriptions. Many of them may not require highly technical knowledge but they are very valuable because their special knowledge is often related to job experience within the firm. In fact, these are often the routes by which unskilled workers initially start work. Their wage rates do not show drastic variation from those of the unskilled. Hence, the wage differentials of skilled mechanics – one degree removed from workers of professional training – would be different and less dramatic.

At the bottom of the pile are unskilled workers. They are the lowest paid among the workers in these formal enterprises. Classifications of unskilled workers are few as they are lumped together in job descriptions that require little specialized knowledge. They belong to the bottom rung of the worker groups because they have no specialized learning. By industry, firms may have different wage patterns for the same class of workers, but unskilled wage earner wages straddle the minimum wage level. There is little variation in the mean wage as the standard deviation is relatively small. This is also the group that has the heaviest competition in terms of job applicants. This is the group that by far creates the excess labor situation for the labor market. *This is the group that validates most of the findings of this study about unlimited supply of labor.*

Educational mismatch: Evidence from State board examinations

But there is more to be said about excess labor supply at the level of educated classes. There is a class of excess labor among the educated labor classes. Some of these workers have acquired little or no work experience in relation to the skills that they had secured their education in and are unable to find a job in that class of undertaking. The oft-repeated observation that the educational system is producing graduates that do not match the skills wanted in industry leads to a condition of excess supply of unsatisfied, educated workers who do not find a job that they to train for. A number of these individuals would end up employed in a gainful occupation. But many of them will become part of the underemployed and or unemployed workers in the economy certainly some will join the ranks of the unemployed.

Table 6 shows the number of examinees of board examinations given by the Professional Regulatory Commission during 2004 and 2005. More than a quarter million examinees took the examination in 2005, a little less in 2004. In 2005, a total of only 35.4% of those who took the examination passed the examination, leaving more about two thirds who did not pass. Non-passers can retake the exam as a general rule and some ultimately do pass. But this high failure rate indicates that there is likely to be a permanent class of repeaters who eventually do not pass.

A number of reasons account for this. Some of them ultimately discover that they do not fit in that profession. Some examination takers have limited financial means. One failure in an examination could be fatal to their family finances because of poverty. A consequence is that the person is forced to accept low paying jobs to suit the failed status. Moreover, there are some types of examinations in which a taker is given only a few chances to pass the exam. This is however true mainly for the highly professional skills that require at least a few years of collegiate study. And some of these types of workers would

be forced by circumstances to look for new jobs that suit their training or who would forever be relegated to the ranks of the unemployed or underemployed.

Table 6. Examinees who took and passed the Board Examination, 2004-2005

| Professional Examination | No. of Examinees | | No. of Passers during year | | No. of Non-Passers during year | | Passing Percent | |
|--|------------------|----------------|----------------------------|---------------|--------------------------------|----------------|-----------------|--------------|
| | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 | 2004 | 2005 |
| Aeronautical Engineering | 127 | 118 | 35 | 38 | 92 | 80 | 27.6% | 32.2% |
| Accountancy | 12,325 | 11,869 | 2,505 | 2,917 | 9,820 | 8,952 | 20.3% | 24.6% |
| Agricultural Engineering | 466 | 489 | 173 | 235 | 293 | 254 | 37.1% | 48.1% |
| Agriculture | 2,519 | 2,243 | 640 | 668 | 1,879 | 1,575 | 25.4% | 29.8% |
| Architecture | 2,123 | 2,452 | 841 | 1,091 | 1,282 | 1,361 | 39.6% | 44.5% |
| Chemical Engineering | 1,038 | 1,184 | 472 | 582 | 566 | 602 | 45.5% | 49.2% |
| Chemistry | 542 | 568 | 250 | 264 | 292 | 304 | 46.1% | 46.5% |
| Civil Engineering | 8,076 | 8,277 | 2,843 | 2,871 | 5,233 | 5,406 | 35.2% | 34.7% |
| Criminology | 11,664 | 11,773 | 3,343 | 3,670 | 8,321 | 8,103 | 28.7% | 31.2% |
| Customs Broker | 1,488 | 1,342 | 218 | 221 | 1,270 | 1,121 | 14.7% | 16.5% |
| Dentistry | 2,966 | 2,648 | 1,019 | 931 | 1,947 | 1,717 | 34.4% | 35.2% |
| Electronics and Communication Eng'g | 7,137 | 7,065 | 2,514 | 2,298 | 4,623 | 4,767 | 35.2% | 32.5% |
| Environmental Planning | 29 | 62 | 13 | 36 | 16 | 26 | 44.8% | 58.1% |
| Fisheries Technology | 118 | 130 | 36 | 39 | 82 | 91 | 30.5% | 30.0% |
| Forestry | 539 | 561 | 189 | 197 | 350 | 364 | 35.1% | 35.1% |
| Geodetic Engineering | 531 | 557 | 225 | 232 | 306 | 325 | 42.4% | 41.7% |
| Geology | 28 | 50 | 16 | 39 | 12 | 11 | 57.1% | 78.0% |
| Interior Design | 167 | 184 | 92 | 79 | 75 | 105 | 55.1% | 42.9% |
| Landscape Architecture | 25 | 29 | 12 | 12 | 13 | 17 | 48.0% | 41.4% |
| Library Science | 599 | 762 | 174 | 240 | 425 | 522 | 29.0% | 31.5% |
| Marine Deck OIC Navigational Watch | 5,019 | 4,628 | 2,133 | 2,001 | 2,886 | 2,627 | 42.5% | 43.2% |
| Marine Deck OIC Navigational Wtch Keep'g Eng'g | 2,342 | 2,244 | 990 | 1,130 | 1,352 | 1,114 | 42.3% | 50.4% |
| Mechanical Engineering | 3,515 | 3,628 | 1,593 | 1,650 | 1,922 | 1,978 | 45.3% | 45.5% |
| Medical Technology | 3,414 | 3,376 | 1,473 | 1,744 | 1,941 | 1,632 | 43.1% | 51.7% |
| Medicine | 4,124 | 4,743 | 2,131 | 2,554 | 1,993 | 2,189 | 51.7% | 53.8% |
| Metallurgical Engineering | 57 | 59 | 33 | 35 | 24 | 24 | 57.9% | 59.3% |
| Midwifery | 3,009 | 4,292 | 1,496 | 2,243 | 1,513 | 2,049 | 49.7% | 52.3% |
| Mining Engineering | 16 | 33 | 9 | 25 | 7 | 8 | 56.3% | 75.8% |
| Naval Architecture and Marine Engineering | 40 | 50 | 11 | 20 | 29 | 30 | 27.5% | 40.0% |
| Nursing | 25,221 | 49,676 | 12,581 | 25,951 | 12,640 | 23,725 | 49.9% | 52.2% |
| Nutrition Dietetics | 552 | 470 | 270 | 235 | 282 | 235 | 48.9% | 50.0% |
| Occupational Therapy | 429 | 353 | 149 | 126 | 280 | 227 | 34.7% | 35.7% |
| Optometry | 73 | 102 | 48 | 74 | 25 | 28 | 65.8% | 72.5% |
| Pharmacy | 2,749 | 2,906 | 1,541 | 1,629 | 1,208 | 1,277 | 56.1% | 56.1% |
| Physical Therapy | 3,808 | 3,078 | 1,142 | 1,059 | 2,666 | 2,019 | 30.0% | 34.4% |
| Radiologic Technology | 697 | 821 | 214 | 277 | 483 | 544 | 30.7% | 33.7% |
| Registered Electrical Engineering | 4,129 | 4,145 | 1,819 | 2,054 | 2,310 | 2,091 | 44.1% | 49.6% |
| Sanitary Engineering | 102 | 132 | 30 | 38 | 72 | 94 | 29.4% | 28.8% |
| Social Work | 1,152 | 1,152 | 553 | 597 | 599 | 555 | 48.0% | 51.8% |
| Teachers Elementary | 60,470 | 67,216 | 16,297 | 18,517 | 44,173 | 48,699 | 27.0% | 27.5% |
| Teachers Secondary | 58,415 | 61,504 | 15,860 | 15,945 | 42,555 | 45,559 | 27.2% | 25.9% |
| Veterinary Medicine | 502 | 550 | 167 | 207 | 335 | 343 | 33.3% | 37.6% |
| X-Ray Technology | 179 | 210 | 50 | 59 | 129 | 151 | 27.9% | 28.1% |
| TOTAL | 232,521 | 267,731 | 76,200 | 94,830 | 156,321 | 172,901 | 32.8% | 35.4% |

Source: Philippine Statistical Yearbook 2007; Professional Regulatory Commission;

There are important conclusions to be derived from this statistical table about the large pool of non-passers in professional examinations given by the state. The obvious one is related to the quality of the outputs of the educational and training system. But others are consequences related to economic issues worth noting.

Many of these professional examinations are given on an annual or semi-annual basis. They have a long history. Passers and non-passers of these examinations cumulate on a yearly basis. The accumulation in the of number of non-passers over time creates a bulge in the labor market among people of learning who are grouped at the lower end of skills. The cohorts of non-passers affect the labor supply in a negative way. They contribute to the swelling of the ranks of those seeking work and who have a lower chance of getting employed in their chosen field. They bring down the wage rate. There is a higher likelihood of their ending up in the ranks of labor available for lower types of skills. Therefore they also end up offering themselves for employment at lower pay. A worse outcome is that they end up in the ranks of unemployed. Under conditions of relatively low demand for employment, these are the workers that end up unemployed. Or they are the ones that create the pressure for wages to become more depressed because they accept relatively low pay.

There are passers of professional examinations who immediately become part of the market with very high demand and therefore have high income prospects. This situation produces an incentive to attract newcomers to that profession. Recently, there has been a noticeable influx of professional takers in these high demand fields. This includes the case of medical doctors, engineers of varying kinds, and certified public accountants. Another set of skills are in the seafaring category, where a relatively large group of examinees take the "marine deck OIC navigational engineering and watch keeping." Seamen represent a significant group among Philippine labor migrants. There has been an increase in the number of takers of examinations, especially, nursing, physical therapy and occupational therapy.

The high demand for skills just mentioned however comes from the international market demand, not from the domestic market. The enlarging supply response in labor training and preparation is coming is a response to foreign demand. This is the part where the particular supply of labor for the skilled workers is upward sloping and not flat, as in the case of the domestic sector. These supply response arise out of the job opportunities that are in high demand in other countries where they have a shortage in these types of skills. Because these countries are high income countries mainly, the consequent implication on wage incomes is a large multiple of the domestic wage. Hence it is a preparation for the migration of contract workers or even permanent migration where the opportunities for migration are clearly in the options available to the worker.

The rising numbers of Filipino overseas contract workers have become a major force in providing foreign exchange earnings to the country that helps to provide annual remittances that grow by 12% to 14% of foreign exchange earnings. The latest monthly remittances have reached \$1.5 billion, thereby contributing immensely to the country's dollar earnings during the year. But these workers become wage earners in the international

economy and not in the domestic economy. What they provide are income and consumption support to their families who live in the country and also an increase in the country's aggregate savings.

It would be useful to speculate on what happens at home when the stream of migrant workers leaves the country. Some of these are only temporary losses for they leave for abroad on a fixed term contract and sometimes return home. A large number of specialized educated skills in the professional fields become permanent migrants even though some of the contract workers find contract renewals elsewhere over time. The migrant workers are a permanent loss in terms of skilled labor for the country. The economic issue is how the domestic economy adjusts to this departure of skills from the domestic labor front.

What is the domestic response to this loss? Because of the high labor supply at home – except in these skills – the cost is not immediately apparent. The departure of the skilled labor is partly met first by the available pool of workers ready to replace the worker departures and by the growth of some of the trained domestic replacements through the outputs in new labor supply of the educational and training system. But the effect is not uniform among the skills that have migrated. During certain periods of the economy, many departures of skilled manpower took place as a result of domestic economic stress. The departure of labor skills however may even helped to maintain domestic demand tranquility since the jobless or the less skilled are able to find jobs because of the departures of skilled workers.²

The high rate of manpower departure for work abroad recently however contributes to some stress on some of the available supply of domestic skills. There is now a growing complaint in industry about the supply loss of labor arising from labor migration. Because the system continues to provide a re-supply of skills especially among younger entrants in the labor force, the labor market continues to provide some of the skills needed by these firms. The reasonable response from competitive firms would be to raise wages, which might be happening. But this is not yet fully reflected in the evidence produced by this paper on the relationship between wages and labor supply. Another response which could be happening is for the introduction of more investments in human capital and in physical capital by the firm. The major interest of firms is to be able to hold the labor skills that they are helping to upgrade at work through training and experience. Another response among domestic firms could be to invest more in physical equipment either to substitute capital for labor or to raise the productivity of the worker. These responses could only induce rising productivity of the worker which makes it justifiable to raise the wage rate. Perhaps this is what is happening, but these results still have to be shown by incontrovertible empirical evidence.

So long as this development of skills migration does not reduce the competitiveness of the domestic firms by excessively raising their training and capital costs, the migration of skills should not bring forth much worrying. The development creates a tightening of the market for labor and at least leaves some opportunity for domestic training of new labor

² Reference is made here during the economic and political turbulence accompanying the imposition of martial law, the long period of economic busts arising from the economic turbulence of the 1980s and the 1990s.

supply. Such tightening could eventually help to erase the excess or unlimited labor available in the ranks of those seeking employment.

Finally, there are trends that are implied by the statistics on state board professional board examinations that are in the direction of either good or bad in terms of consequences in the long term.

With respect to the beneficial directions, there is an apparent supply response in terms of improvements of public and private school programs in some critical fields of professional study. Some shift of investments is being caused by the demands of the changing economy. The question is one of intensity and quality of resources being put into these changes. The high number of enrollments in nursing schools is partly a response to the opening of new programs offered for this course. New offerings on of nursing programs have required schools to raise their facilities and program offerings. The growth of back-office outsourcing has called attention to the rapid employment of new graduates and personnel with a strong and sufficient background in the English language. This has also caused an intensive program of training to improve the proficiency in the use of that language among new graduates.

Another implication of the growing scarcity of science based skills has increased attention toward improving technology and science offerings in the universities and also placing a corresponding degree of specific skills development in the vocational skills. The training program administered by the government's Technical Education and Skills Development Authority (TESDA) is under scrutiny to provide relevant vocational and specialized short term trainings to the requirements of the work place. Moreover, the presence of training incentives in the investment and fiscal incentives of the government has helped companies to make use of training incentives as part of their manpower programs.

Then, directly from the evidence from these examinations, professional fields that used to attract candidates in the state examinations are suffering a reduction in examination takers. This is especially true of accounting. The accounting profession has grown to a widely available field in the country because of the high profile of business schools for years. The high number of takers (around 12,300 in 2004) is also accompanied by passing rates of 20 percent to 25 percent per year. In 2005 however, there has been a drop to 11,869 of the number of takers of accountancy. This need not be a trend, but if it is an indication, of shift there are those in the labor force who realize the greater attraction of other fields of work. Despite the need for them in a growing business, many accounting and bookkeeping jobs are kept by those who have failed the certified public accountants. This explains in part the disparity of wages between accountants and accounting and bookkeeping clerks.

The piece of disturbing news is related to the high failure rate of those taking examinations for elementary and secondary teaching. This is a popular examination. It is also an important component of the educational program of the government. In 2005, there were more than 67,000 examiners for elementary school and 61,000 for secondary schools. The passing rate for these exams however is only slightly above one-fourth (27%) among the examination takers. This implies that – if this rate were a continuing trend – there are quite a large number of those trained to undertake teaching in the educational system that

are not qualified for the job. This is an indictment on the quality of the educational system which is supposed to be the primary trainer of the country's basic skills that are learned in early schooling.

VII. Conclusions

An attempt to fit a supply of labor for the industrial sector based on unit records from a survey of manufacturing industry shows that wage does not enter as an explanatory variable for the supply of labor. Even if it statistically significant estimates of the regression coefficients are found, the impact on supply is very negligible because the values for these coefficients are close to zero. Interpreted in economic terms, this confirms the unlimited supply of labor. The labor pool actively in search of jobs finds itself to be located within the zone of the excess labor supply where there is not enough demand for labor. As a result, those seeking employment are in active competition with the rest of the labor supply that wants to be employed at the going market rate.

In this situation, the market wage rate is that one that is imposed by general economic conditions or by the labor regulations. That "market" rate could be the minimum wage rate or some other wage that is adjusted for skill differentials that current market scarcities might allow for the specific labor skills that are wanted. The training of labor is the only major cost that contributes to this differential in wages. The total supply of labor is determined of course by the usual demographic and economic factors at the national level. These factors include the size of the population, the rate of population growth, and the various determinants of the labor participation of women and children in the market. Therefore, the overall nature of the supply of labor depends on major factors that contribute to a nation's pool of labor resources at any given time – a population awareness policy, health and nutrition issues for women and children, and the state's allocation of public expenditure for education.

The econometric agenda chosen here has been to determine whether that existing pool of labor and the wage rate produces the expected relationship that hiring more labor requires an upward push of the wage rate. No such strong relationship exists to support this thesis. Given the current situation in the labor force in which there is a large segment of labor out-migration, what saves the situation into having a slightly positive coefficient for the wage rate is the size of that out-migration.

The main finding of the econometric investigation confirms the common phenomenon observed in the Philippines about the high level of unemployment and underemployment. The national economy is unable to generate sufficient demand for labor that makes it incapable of pushing the demand for labor toward the turning point of the upward sloping aggregate supply of labor. This poses the question of why this has happened. During its more than six decades of political independence, the economy has generally succeeded in bringing in growth and development. Of course part of the problem has been that this economic record has happened in the context of erratic episodes of economic booms and busts? A more complex explanation is in order.

Additional probing into the labor market is made, examining the varieties of occupations and the wage differentials observed among them. Most of the firms and

establishments covered in the econometric investigation belong to the formal industrial sector. They probably account for a high proportion of total output although they are only a minuscule part of the overall enterprises in the economy which abound with many small enterprises. The occupations and their wage differentials are mainly from the same population of firms used in the econometric investigation. But the survey was done with different questions in mind. It is also true that in the Philippine economy, there is a preponderance of small firms. In the context of sheer number of firms, they dominate the economic scene. But they do not produce most of the output. There is far more concentration of industrial output and services by the larger firms in the economy.

Arising from this fact is that great varieties of skill differentials found in the economy as reported from a survey of occupations does not generally capture the number of those who are excluded from the survey – which consists of a large pool of workers who are in the small enterprises. In fact, many of these enterprises involve a lot of self-employed. And there is a large segment of this sector which is essentially in the informal sector. Such a sector that includes the labor pool of underemployed and self-employed is like an accordion – it thins out or enlarges depending on overall economic conditions. When the economy is bullish and the demand for labor rises, this sector is likely to thin out because labor moves into the formal sector of the economy. But when economic conditions become difficult and unemployment enlarges, it is this sector that absorbs part of the difficulty. What appears to be continuing employment is essentially a condition of underemployment and low labor incomes.

Thus, occupational wage differentials exist despite the presence of abundant – and even unlimited – labor. What this labor condition does is to enable the employer to enjoy much greater freedom to dictate the wage rate that is in consonance with the prevailing condition of the general labor supply. Hence, wage differentials do not become wider but in fact have a tendency to be narrower. Of course, the occupational groups that are most in high demand will have a high dispersion in skill differentials. The closer they get to the occupational groups that have lower skills or even close to the unskilled, such the dispersion in wage incomes would be less. And in general, therefore, the overall wage rate – or labor income – is weighed down heavily to the wage rates of the groups with the lowest skills. This explains in general why the average income of labor is low in the domestic economy compared to other more successful economies where unemployment issues are no longer pressing.

Finally, the discussion of statistics on passers and non-passers of various state professional board examinations can only support the accumulation of a supply of educated unemployed who help to swell the ranks of those seeking employment.

Why has this state of unlimited labor continued to persist in the Philippine economy? The answer lies in the relatively modest growth of the economy over time compared to that of other East Asian countries. In part, this poor performance is the result of the philosophy of economic development that has dominated the country's thinking over decades of development experience. One has to go deep into the historical record. In 1935 (more than one decade before political independence and despite the interruption of a destructive World War II in the land), the country's politicians instituted restrictive

provisions in the political constitution that has had long term effects on the future. These restrictive provisions reduced the flexibility of the nation's current leaders to institute the proper remedy to attract capital to go where it was most needed. Because of additional restrictions that were imposed by a period of misguided industrial policy during a period of protection and import substitution, enormous capital was wasted in wrong industries.

The country has paid the price of excessive economic restrictions and has in fact moved towards correcting them. Measures to reform many economic policies are significant: those dealing with industry and trade, with banking and domestic reforms, with various tax incentives, with foreign exchange, and capital movements to attract foreign capital. However, these reforms appear like icing the cake without dealing with the core issue. The restrictive economic provisions are embedded in the Constitutional provisions on land ownership, and on restrictions that severely limits the amount of foreign capital participation in the country's public utilities and in natural resources exploitation, a topic exhaustively treated elsewhere (see Sicat, 2007).

A Supreme Court acquiescence to a policy of service contract in 2005 recently made it possible for foreign capital to participate more actively the exploitation of natural resources. The long delay before *legal clarity* applied to the mining sector has at least freed the sector from the restrictions that had hampered the country for a long period of time. During that time period enormous development could have been undertaken to raise the country's growth. The effect of dealing with these constitutional issues is the greatest challenge of development policy in the Philippines. It is the assurance that it will remove the conditions for a rapid progress in the movement of needed capital in land, in public in public utilities, in infrastructure. It is the key toward opening the economy to the full benefits of globalization so that the domestic demand for labor will become strong in the economy and the domestic supply of labor will leave the zone of unlimited labor and move into that zone of rising wage.

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