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The Impact of Globalization on Labour Supply: The Case of Malaysia

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ABSTRACT

Globalisation is the result of a borderless world, where interlink between countries in the world becomes more intense and flow of inputs between one country to another will be much easier. Globalisation opens the economy, moves goods, services, capital, labour and technology physically. In the context of labour market, the inflow of labour input is more relevant, because it gives implication on local labour especially in terms of job opportunities. Individual perception on the impact of globalization may change their attitude towards being working, but on the other hand, the labour supply may increase to cope with increasing cost of living due to globalization. This paper attempts to investigate this issue using time series data. In this model, the basic labour supply determinants are own wage and population. Apart from this, the globalization indicators such as foreign direct investment, trade, technology and foreign workers will also be incorporated as independent variables. The estimated long-run parameters which are readily available from the Johansen-Juselius (JJ) procedure suggested that wage (W), population (P), Foreign Direct Investment, (FDI), Number of Technologies Agreement (TEC), and Net Trade (XN) are positively associated with Labour Supply (SSL). Evidence from VECM showed that in the short run, wage (W), population (P), foreign direct investment (FDI) and openess economic (OPN) tend to impact significantly on labour supply (SSL) within one year lag period.

Keyword: Globalization, labour supply, Malaysia, wage.

INTRODUCTION

Globalisation is a phenomenon that cannot be avoided. The world economy is moving towards global integration. The globalisation issue has already been long debated by researchers. Economic globalisation is characterised by production, exchanges, distribution, and consumption of goods and services. Through the globalisation process, the capital moves with ease between countries, companies that manage production on a global scale in sourcing for cheaper cost and higher profit margin across the border. This results in global economic relations expansions that exist through international trade, investment, production, financial exchanges, labour migration, organisational practices and international collaborations (Waters, 1995). In the recent debate on the effects of increasing international integration on the labour market, most of the attention has been devoted to evaluate the impact of trade on wages and employment. However, there might be other paths through which globalization influences the labour market, one of these is the effect on labour supply.

Labour supply plays a very important role in an economy's development. A robust and sufficient labor force promotes development, and development, in turn, feeds back on labour market conditions. Two aspects of labour supply have been important; firstly, quantity of labour as represented by population growth rates, rising female labour force participation rates and migration. Secondly, quality of labour as represented by education levels and health status (life expectancy). In the context of labour market, the inflow of labour input is more relevant, because it gives implication on local labour especially in terms of job opportunities. Individual perception on the impact of globalization may change their attitude towards being working, but on the other hand, the labour supply may increase

to cope with increasing cost of living due to globalization (Poo, et. al., 2011). This paper attempts to investigate this issue using time series data. The labour supply model will be the basis for the analysis. In this model, the basic labour supply is own wage. However, the extended labour supply model incorporates globalization indicator as another independent variable. We hypothesis that the main determinants of labour supply is own wage. Therefore, the objective of this article is to examine determinant(own wage) of labour supply by taking into account the globalization effect.

TREND OF LABOUR SUPPLY IN MALAYSIA

Labour supply can be defined as number of population aged between 15-64 years old working or seeking jobs in a particular period. There are various factors that determine labour supply like birth rate, death rate, migration and labour force participation rate (LFPR). The most important determinant of labour supply is LFPR, which is defined as number of labour force divided by number of population aged 15-64 years old.

Table 1 presents the LFPR for Malaysia for the period 2001-2009. It is shown that the LFPR for the total economy was declining from 64.9% in 2001 to 63.2% in 2007 and the same patterns are shown by male's and female's LFPR. The LFPR of the males is far higher than that of the females by almost double. The declining in the LFPR can be explained by several reasons such as the higher growth of the population within the working age compared with the number of the labour force, economic slowdown that affect job creation and high unemployment rate. The higher LFPR for males is expected since the dual roles of the females could hinder them from being in the labour market even though they are educated or qualified. One of main obstacles for the females to be working is child - bearing duty after they are married.

In 2010 total number of labour force in Malaysia was 11, 566.8 thousand persons or abour one-third of Malaysian total population. Of this, 11,171 thousand persons are employed and the remaining 385.8 thousands are unemployed. The unemployment rate was 3.3% which is considered as low and within the definition of full employment (see Table 2).

LITERATURE REVIEW

In general, studies on the determinants of labour supply are closely related to studies on wage determinants. Mincer (1974) argued that wage is mainly determined by level of education and other individual's characteristics like working experience, types of job, location and gender. The labour supply model, which is based on Becker and Gilbert 91975) Household Production Model, and Fallon and Verry (1988) demonstrates almost the same factors that determine labour supply as determinants of wages

The elasticity of labour supply with respect to wage rate plays a critical role in many economic policy analyses. There are many studies of labour supply elasticity accessible. Most of the empirical results for the elasticity of hours of work with respect to the wage rate significantly differ in sign and range. It appears from the literature that the first estimation on the labour supply elasticities was made by Douglass (1934) in his 'Theory of Wage'. He collected and aggregated the data for 38 US cities from census of manufacture and examined both time series and cross-section data on hours of work and hourly earnings. He concluded that labour supply elasticities are between negative 0.1 and 0.2 (citation in Evers, et. Al.,2008). Evers, et al. (2008) mentioned that modern labour supply often separate the income and substitution effects and make use of micro data instead of aggregated data. Using data from US coal mining in the first decades of the 20th century, Boal (1995) finds the labor supply elasticity to be in the range 1.9–6.8 in the short run and infinite in the long run. However, Manning (2003) shows that the quantitative relationship between employment and wages depends crucially on whether wages are regressed on employment or the other way around, and indicates that the reason is measurement error. He concludes that even though it is reasonable to interpret this relationship as evidence of upward sloping supply curves, such regressions 'are just not very informative' on the supply elasticity.

Blundell and MaCurdy (1999) report that across 18-20 estimates of own wage labor supply elasticities in various studies; the median elasticity was 0.08 for men and 0.78 for married women. Filer, Hamermesh and Rees (1996) showed that the middle-level estimates of labor supply elasticities as equaling 0.0 for men and 0.80 for women. For cross wage elasticities, Killingsworth (1983) point out that a median spouse wage elasticity of 0.13 for married men's labor supply and -0.08 for married women's labor supply, although study of the 1980s by Devereux (2004), analyzing labor supply

conditional on having positive hours, reports a cross elasticity of roughly -0.4 to -0.5 for women and -0.001 to -0.06 for men. These surveys indicate that women's labor supply is considerably more sensitive to their own wages than is men's. This difference is usually explained by the traditional division of labor in the family, in which women are seen as substituting among market work, home production and leisure, while men are viewed as substituting only or primarily between market work and leisure (Mincer, 1962)

The effects of foreign workers are traditionally viewed in terms of complementarity or substitutability with natives in the production of household service. In the literature review, most of the simple theoretical models of labour supply suggest that an increase of foreign workers in the native labour market may result in lower wages and/or higher unemployment of natives if they are perfect substitutes to immigrants. In addition, empirical studies typically conclude that immigration has economically irrelevant or no effects on wages and employment of natives, see Borjas (1994) for survey, is that foreign workers do not have a sizeable and significant effect on employment and wages of natives in the same segment of the labour market, even when the foreign workers supply shock is large. Card (2001) uses 1990 census data to study the effects of immigrant inflows on United State labour market. He found that immigrant inflows over the 1980s reduced wages and employment rates of low-skilled natives in Miami and Los Angeles by 1-3 percentage points. These finding imply that massive expansion of immigrant may have significantly reduced employment rates for younger and less-educated natives in both cities.

Borjas (2003) analysis indicates that immigration lowers the wage of competing workers: a 10 percent increase in supply reduces wages by 3 to 4 percent. Using German data for the period 1975-1997, Bonin (2005) concludes that the direct impact of immigration on native wages is small as a ten percent increase in labor supply stemming from immigration is predicted to reduce wages by less than one percent, with a stronger negative impact for low-skilled natives. In recent work based on US census data, Ottaviano and Peri (2008) extends the structural modeling approach of Borjas (2003) to assess the overall impact of immigration on wages while allowing for imperfect substitutability between native and immigrant workers. Their empirical estimates point to a negative, but small, direct partial effect: an immigration shock that increases the labor force in a particular skill cell by ten percent reduces wages of natives of the same group by approximately one percent. However, Peri and Sparber (2009) argue that increased specialization might explain why many empirical analyses of the impact of foreign workers on wages and employment for less-educated native born find small effects. They found that foreign workers specialized in occupations that required manual and physical labour skills while natives specialized in jobs more intensive in communication and language tasks. While Mocetti and Porello (2010) showed that immigration in Italy had a displacement effect on low educated natives (both for male and females).

There are three different mechanisms through which trade openness affects labor market by gender. First, the gender distribution of the impact in terms of employment will depend on the sectoral intensity in the use of male and female labor. If trade openness benefits sectors intensive in male (female) labor, men (women) employment will improve.

The second mechanism stems from this effect. Indeed, the changes in the relative demand by gender affect the earnings gender gap. Therefore, we may expect that a female intensive sectors growth would decrease the gender gap. Anyway, labor discrimination will contribute to widen or reduce the effect on the gender gap. A third source comes from the change in labor supply induced by modifications in employment opportunities and wages (Maria, et. al., 2007).

Petters (2005) in a research for Germany market tests whether the compensatory effect of innovation is bigger than the displacement effect, and she makes a contribution to the model by discerning each kind of innovation (process and product) concerning the level of novelty. The product innovation is classified like "new product for the market and for the firm" and "new product for the firm but not for the market"- the firms of the last kind are called "follower firms". And process innovation is classified like "process innovation aimed at rationality of production factors" and "process innovation aimed at improvements in the product quality". The results show that product innovation is positively correlated with employment, as much as in the firm that supplied a new product for the market, as in the follower firms. The labor supply elasticity in relation to product sales growth rate, in both firms, is unitary and does not present significant differences, which is denying the hypothesis that the innovation impact on employment depends on the novelty level

THEORETICAL UNDERPINNINGS AND MODEL SPECIFICATION

Households are suppliers of labour. Individuals are assumed to be rational and seeking to maximize their utility function. The static labour supply theory assume each individual has a quasi-concave utility function (Blundell and Macurddy, 1999; Manning, 2003) :

$$U = f(C,L) \quad (1)$$

Where C is the consumption and L is the leisure hours, However, individuals are constrained by the working hours available to them. Therefore, hours of work (H) are H = T – L, T is the total time available. Suppose P is the price of goods and service, W is hourly wages rate and non-labour income, Y. The individual budget constraint is:

$$PC = WH + Y$$
$$PC = W(T - L) + Y$$
$$PC + WL = WT + Y \quad (2)$$

In static model, non labour income, Y is typically the sum of two components: asset income and other unearned income. The right side of equation 2 often defined as "full income" from which consumer purchases consumption goods and leisure (Blundell and Macurddy, 1999). Derivation of individual's labour supply function is derive by maximize utility function subject to the budget constraint. The indirect utility representation of preferences is given by :

$$V = (P,W,Y) = MaxU(C,T-H) \text{ s.t. } PC = WH = Y$$

Set the Lagragian expression;

$$L = (C,H,\lambda;P,W,Y) = U(C,T-H) - \lambda(PC - WH - Y)$$

The first order conditions are ;

$$\frac{\partial L}{\partial C} = U_C(C,T-H) - \lambda P = 0$$

$$\frac{\partial L}{\partial H} = -U_L(C,T-H) + \lambda W = 0$$

$$\frac{\partial L}{\partial \lambda} = -PC + WH = + = 0$$

Or simply the first two conditions take the familiar form;

$$\frac{U_L(C,T-H)}{U_C(C,T-H)} = \frac{W}{P} = \text{Marginal Rate of Substitution (MRS)}$$

Therefore, the individuals labour supply equation is obtained as below;

$$H = H(P,W,Y) \text{ or}$$
$$H = H(\frac{W}{P},Y)$$
$$H = H(HSW,Y) \quad (3)$$

Where $\left(\frac{W}{P}\right) = HSW$.

We assumed that Y is equal to zero and P is constant, thus nominal wage (W) is equal to the real wage (HSW). Since the main purpose of the study is to look at the impact of globalisation on labour market structure, the data also cover population (P), Foreign Direct Investment, (FDI), Foreign Labour

(FL), Openness Economy (OPN) , Number of Technologies Agreement (TEC) and Net Trade (XN) . Therefore, equations (3) can be written as,

$$H = H(W, P, FDI, FL, OPN, TEC, XN) \qquad (4)$$

where hours of work (H) = labour supply (SSL)
This study employed annual data spanning from 1980 to 2009. In this study, data has been collected from Economic Planning Unit(EPU). The data set consists of dependent variable namely labour supply(SSL) and seven independent variables. The independent variables included are wages(W), population (P), Foreign Direct Investment, (FDI), Foreign Labour (FL), Openness Economy (OPN), Number of Technologies Agreement (TEC) and Net Trade (XN). All series are log-transformed.

$$LSSL = \alpha + \beta_1 LW + \beta_2 LP + \beta_3 LFDI + \beta_4 LFL + \beta_5 LOPN + \beta_6 LTEC + \beta_7 LXN \qquad (5)$$

Here, α is the constant term and each coefficient shows the elasticity of labour supply with respect to the changes in the associated variable. In order to estimate these coefficients, the study looks for suitable econometric method the value of the coefficients.

EMPIRICAL RESULTS

In this section, we analyze the data for this study using e-vies 7.0. The unit root tests via Augmented Dickey Fuller and Phillips-Perron indicated that base on levels the data have unit root and after the first difference the time series were stationary in order of one. The cointegration test indicated that there exists one cointegrating vector at 1% level of significance both the Vector Error Correction Model (VECM) . Table 3 reflects the descriptive statistics variables that display the characteristics of the data in the study.

Unit Root Test

Since many macroeconomic series appear to be non-stationary as Nelson and Plosser (1982) affirmed, the data series was tested for stationary using the Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) test as starting point to assess the order of integration.

The null hypothesis states that the series has a unit root, meaning the sequence contains a unit root process (non-stationary) while the alternative hypotesis indicates that the series is a stationary process (stationary). We reject the null hupotesisi of the unit toot test if the t-statistics of the varibale is at least smaller than the 5% Dickey- Fuller critical value as indicated by Mackinnon (1996). In Table 4, we display the ADF and PP unit root test results fo level and at firts difference with intercept. From the result of the tests, we are unable to reject the null hypothesisi of the unit root at 5 % significance level.

From Table 4 , it is obvious that these series are not stationary at level, thus we proceeded to the first difference. At this stage all the variables are stationary or I(1), therefore, we reject the null hypothesis (that the series has a unit root) and accept the altenative for each of the variables.

The results for ADF and PP test at first difference; here the probabilities are all less than 5% Dickey-fuller critical value. We reject the null hypotesis based on the first diferrence. The series in integrated of order one or are I(1). Ordinarilty the variables are not stationary but after the first difference it became stationary.

The results of the unit root test at firts difference analysis affirmed the need to test for cointegration among these variables. We move on to test for cointegration using the Johansen-Juselius cointegrating technique that allows for the existence of multiple cointegrating relationships.

Cointegration Test

The next step is to check whether the stationary series are cointegrated. Johansen cointegration technique was employed to determine if there exists a long-run equilibrium. The choice of this technique is informed by the need to determine the several characteristic of the variables that are employed in this study. The lags interval (in first difference) is one to one.

From Table 5, λ_{trace} test statistics results indicated that there is exactly four cointegrating vector at 1 % level of significance in the model. This means that a single vector uniquely defines the cointegration space (Harris and Sollis, 2003). As Ender (2004) stated, “cointegrated variables share the

same stochastic trends and so cannot drift too far apart". This suggests the existence of one long-run relationship between the series. The cointegrating can be seen on Table 6 below.

In this case, the dependent variable is LSSL while LW, LP, LFDI, LTEC, LFL, XN and LOPN are the independent variables. The estimated long-run parameters which are readily available from the Johansen-Juselius (JJ) procedure suggested that wage (W), population (P), Foreign Direct Investment, (FDI), Number of Technologies Agreement (TEC), and Net Trade (XN) are positively associated with Labour Supply (SSL) and significant, while Foreign Labour (FL) and Openness Economy (OPN) has negative relationships with labour supply though there are significant. This implies that W,P,FDI, TEC and XN plays significants roles on labour supply. The results implies that FL and OPN is significant but does not contribute positively to labour supply. Since there ia at least a cointegration vector explaining the long run relationship amaong varibales, we proceed to the estimation of the VECM model.

Vector Error Corrections Model(VECM)

Table 7 reports the results from estimation of the VECM with choice of lag intervals as 1 which was determined by Schwarz info criterion (SIC). The vector error correction model (VECM) results obtained from equations are given in table 5. A set of necessary standard diagnostic test was conducted during the process of estimation to rule out any discrepancies which clearly indicates that there are no serial correction, heteroscedasticity and no multi-collinearity.

Relying on the presence of a cointegrating vector, the subsequent vector error correction model (VECM) can be written as follows :

$$\Delta lnSSL_t = \alpha_1 + \Sigma^a \Phi_1 \Delta lnw_{t-i} + \Sigma^a \Omega_1 \Delta lnP_{t-i} + \Sigma^a \Upsilon_1 \Delta lnFDI_{t-i} + \Sigma^a \Upsilon_1 \Delta lnTEC_{t-i} + \Sigma^a \delta_1 + \Sigma^a \tau_1 \Delta lnXN_{t-i} + \Sigma^a \sigma_1 \Delta OPN_{t-i} + \Psi_1 ECT_{t-i} + \varepsilon_i \quad (6)$$

Where Δ is the firt difference operator, Ect is the error correction term coming from long run cointegrating ralationship, i.e. residuals, and the term a ia lag lenghts. In this persimonious VECM , the lag lenghts could be equal to zero for the variables that are not also depedent variables. The coefficients of ECT_{t-1}, Ψ_1, capture the adjustments of ΔlnW, ΔlnP, ΔlnFDI, ΔlnTEC, ΔlnFL, ΔXN, and ΔOPN towards long -run equilirium. The short-run relationships can be tested through coefficients of each explanatory variable.

The vector error correction model (VECM) estimation obtained from equations (6) is given in Table 7. A set of necessary standard diagnostic tests was conducted during the process of estimation to rule out any disrepancies. The results presented in Table 7 show that the ECT coefficients of equations (6) is significant and have negative signs implying that the series can not dritf too far apart and convergence is achieved in the long run. More specifically, each ECT cofficient indicates that a deviation from the long run equilibrium value in one period is corrected in the next period by the size of that coefficient. For equation (6) the correction is around 40 percent, respectively. The ECT coefficient of equation (6) has negative sign and significant. From Table 7 we can also see that wage (W), population (P), foreign direct investment (FDI) and openess economic (OPN) has significant impact on labour supply (SSL). In the short-run, it can be observed that fluctuation-type relationships exist in general. Further, almost all adjusments take place within the same or following time periods, implying that the system settles down quickly.

CONCLUSION

The paper investigated empirically the impact of globalization on labour supply using Johansen cointegration technique and vector error correction analysis. The result suggested that wage (W), population (P), Foreign Direct Investment, (FDI), Number of Technologies Agreement (TEC), and Net Trade (XN) impacts positively on the labour supply (SSL) in the long run, while Foreign Labour (FL) and Openness Economy (OPN) impacts negatively on labour supply. This implies that W,P,FDI, TEC and XN plays significants roles on labour supply. Evidence from VECM showed that in the short run, wage (W), population (P), foreign direct investment (FDI) and openess economic (OPN) tend to impact significantly on labour supply (SSL) within one year lag period.

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TABLE 1: Malaysia, labour force participation rate, 2001-2009 (%)

	2001	2003	2005	2007	2009*
Total	64.9	65.2	63.3	63.2	63.1
Malei	82.3	82.1	80.0	79.5	79.5
Female	46.8	47.7	45.9	46.4	46.0

*Estimated

Source : Labour Force Survey Report, Department of Statistics Malaysia, 2010.

TABLE 2: Malaysia, number of labour force, 2010

Number of labour force ('000)	11,566.8
Employed ('000)	11.181.0
Unemployed ('000)	385.8
Unemployment Rate (% of labour force)	3.3
Labour Force Participation Rate (% of population aged 15-64 years)	62.2

Source: Labour Force Survey Report, Department of Statistics Malaysia, 2010.

TABLE 3: Statistic Descreptive Variable

Variable	Mean	Median	Maximum	Minimum	Standard Error	N
LNSSL	8.9322	8.9332	9.2963	8.4897	0.2566	30
LNDDL	12.1789	12.2478	13.5126	10.8838	0.8363	30
LNY	7.9126	8.0075	8.7183	7.0031	0.5595	30
LNP	9.4094	9.4234	9.7984	8.9677	0.2571	30
LNW	11.6917	11.9225	12.2026	10.8973	0.4279	30
LNFDI	4.5394	4.8024	5.5814	3.0016	0.7831	30
LNTEC	6.6249	6.6827	7.0039	5.8081	0.2926	30
LNFL	13.0353	13.0597	13.8801	11.6553	0.7955	30
XN	382.1008	146.7597	1185.256	-132.3870	431.1255	30
OPN	1.4247	1.5096	1.9212	0.8836	0.3699	30

TABLE 4: Augmented Dickey Fuller (ADF) and Philips Peron (PP) in Unit Root Test

	ADF test statistic		Philips Peron	
Variable	At level I(0)	First Difference I(1)	At level I(0)	First Difference I(1)
lnSSL	1.9548	6.5322***	1.9948	5.3030***
lnW	1.8197	3.8860**	1.8191	2.4281
lnP	1.4909	3.2469**	3.2469**	1.2942
lnFDI	2.4128	6.2845***	2.3838	6.2845***
lnTEC	2.5879	6.1039***	2.4485	11.6089***
lnFL	0.9539	5.6603***	1.5693	4.6202***
XN	1.3819	7.3048***	0.5112	5.1608***
OPN	1.2369	3.2101**	1.2943	3.3574**

Note : all varibales are in their log form expecially XN. We use Scharwz information Criteria with a maximum lag lenght 0f 7. (***) denotes significance for 1%. For Phillips-Perron unit root test, we use Bartlett Kernel Spectral estimation method and select Newey –West Automatic Bandwidth. The figus in parenthesis are the probabilities.

TABLE 5: Johansen Cointegration based on Trace Test

Hypothesized		Trace	1 Percent
No. of Coeeficient (s)	Eigenvalue	Statistic	Critical Value
r=0*	0.9894	383.9277	171.0905
r=1*	0.9644	256.5738	135.9732
r=2*	0.8407	163.1612	104.9615
r=3*	0.7553	111.7325	77.81884
r=4*	0.6983	72.32073	54.68150
r=5	0.5102	38.76589	35.45817
r=6	0.3856	18.78038	19.93711
r=7	0.1677	5.139289	6.634897

Note : Trace test indicates 5 cointegration equation at the 1 % level of significance as indicated by*

* denotes rejection of the hypothesis at the 1% level

TABLE 6 : Co integration Test Equation

lnSSL	lnW	lnP	lnFDI	lnTEC	lnFL	XN	OPN
1.0000	-0.0769	-0.7925	-0.0426	-0.8047	0.0627	-7.17E-05	0.1699
	(0.0129)***	(0.0191)***	(0.0022)***	(0.0075)***	(0.0082)***	4.3E-06***	(0.0081)***

Note: 1 Cointegration equation (s) Log likelihood 225.0898 Normalized Cointegrating coefficients (standard error in parentheses) *** (1%), ** (5%), *(10%)

TABLE 7 : VECM Estimates of Impact Globalization on Labour Supply in Malaysia

Variables	Coefficients	Standard Error	T-Statistics
CointEq1	-0.4001	0.1080	-3.7028***
Δ(lnSSL(-1))	-0.0706	0.0267	-2.6471***
Δ(ln(W(-1))	-0.0171	0.0058	-2.9325***
Δ(ln(P(-1))	-3.8098	0.7977	-4.7756***
Δ(lnFDI-1))	-0.0168	0.0050	-3.3655***
Δ(lnTEC(-1))	0.0189	0.0123	1.5395
Δ(lnFL(-1))	0.0161	0.0342	0.0342
Δ(XN(-1))	0.2291	0.2386	0.9604
Δ(OPN(-1))	-0.3878	0.19762	-1.9623**
C	-0.0866	0.0229	-3.7775***

Note: Included observations : 28 after adjustments