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GLOBALIZATION AND UNEMPLOYMENT IN PAKISTAN

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Abstract

This study analyzes the impact of globalization on unemployment in Pakistan, using annual data for the period 1980 to 2013. Using the ARDL econometric framework, we find that the economic, political and social aspects of globalisation differ in their effects. The data suggest that political and social integration, whilst beneficial in the short run, increase the long run expected unemployment rate. Economic integration appears to be only marginally beneficial in the short run; it is significantly beneficial in the long run but cointegration with the other aspects of globalisation means that it cannot fully counteract their undesirable long-run effect.

Keywords: Globalization; Unemployment; ARDL; Pakistan

JEL codes: O11; O19

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1: Introduction

Globalization is an acknowledged feature of the modern world and is often argued to be a potential impetus for economic growth and development at the national level. Though there may be some concerns, for example regarding whether it is a vehicle for cultural imperialism by the West (Burtless *et al.*, 1998), recognition of globalization has shaped the reform agenda in several developing countries (Sachs and Warner, 1995; World Bank (2002); Bacchetta, *et al.*, 2009). Arguments offered in favour of globalization include that it will facilitate the integration of a developing economy into world markets and institutions, help cultural exchange and diffusion, help develop better governance, be a source of beneficial inward transfer of knowledge and technology, and improve cross-border capital flows. Taken together, these factors are expected to accelerate the pace of economic development and reduce the incidence of poverty through creation of income generating activities. In contrast to these claimed benefits, some scholars (see, for example: Borrell, 2006; Ogunwa, 2012) warn that countries which are at an early stage of economic development, thus relatively under-endowed in fixed capital and human capital, may lack a basis for benefitting from increased openness and so find globalization to be a curse rather than a blessing.

Taking Pakistan as a case study, and the unemployment rate as an indicator of non-beneficial economic development, this paper will undertake an empirical assessment of the extent to which globalization has been beneficial for this particular developing economy.

Because of data limitations, we examine the period since 1980, during which time Pakistan's economic policy has shown some consistency. During the 1970s, Pakistan undertook a program of nationalization of its major industries. A change of government in 1977 led to rapid re-privatization of the non-bank sectors and a policy platform that included economic liberalization. Since that time, economic liberalization has remained a cornerstone of policy under several changes of government.

The rest of the paper is organized as follows. Section 2 is a brief literature review; section 3 discusses the data and methodology; the empirical results are presented in section 4 and section 5 concludes.

2: Literature Review

In his survey of the labour market consequences of globalization in developing economies, Rama (2003) argues that the economic liberalization that represents an acceptance of globalization leads to both job destruction and job creation, with the former initially dominating. The implication is that we should expect a short term increase in joblessness in the period following economic reforms. On the other hand, he finds that the empirical evidence has not always been consistent with this expectation. Similarly, Dev (2000) surveyed the consequences of economic liberalization for the countries of South Asia, concluding that the fears of a negative impact on aggregate employment had proven to be unwarranted, though there was some evidence of an increased degree of casualization within the workforce.

In their survey of the literature investigating links between trade, trade policy and labour market outcomes, Hoekman and Winters (2005) note that globalization might be expected to improve labour's market value in developing economies because trade is a channel for promoting technological upgrading. Osmani (2006) concluded that globalization had indeed led to improved employment opportunities in Bangladesh, directly through a net gain in employment in the tradeable goods sector and also indirectly through a consequent increased demand for goods produced in the non-tradeable sector. Using various measures for the economic, social, and political aspects of globalization, Malik *et al.*, (2011) offer empirical support for the contention that the economic aspects of globalization are associated with increased employment opportunities in Pakistan. Using a measure of Nigeria's global competitiveness as an indicator for globalization, Ogunrinola and Osabuohien (2010) found a positive impact of globalization on that country's manufacturing employment. Analyzing the impact of

globalization on employment in Bangladesh and Kenya, Sen (2002) found a positive relationship in Bangladesh but, as a counter-example, a negative relationship in Kenya.

The consequences of globalization may not be uniform throughout an economy. For example, Yasmin and Khan (2005) estimate that trade liberalization has increased the elasticity of demand for labour in manufacturing; thus amplifying the increased employment that follows from any shift in labour demand occasioned by larger export volume. Their caveat is that such improved employment opportunities may be limited to highly skilled labour. In the same vein, Majumder (2008) argues that whilst globalization may have led to higher per capita GDP in a developing economy, there is a strong possibility that the benefits will not be shared throughout society – as evidenced by growing income inequality and a degraded quality of employment opportunities outside of the modernized sector. Lee *et al.*, (2010) provide a theoretical underpinning by extending the Harris-Todaro (1970) model of rural-urban migration to accommodate international capital flows as an indicator of globalization. Their analysis predicts that increased globalization leads to lower unemployment in the modernized (urban) sector. Ghose (2008) argues, however, that (i) the relatively minor contribution of the modernized sector in developing economies means that much of the existing research into trade-employment linkages may have low relevance and (ii) shortcomings in labour market data further inhibit a proper understanding of the consequences of globalization for developing countries.

Given the existing diversity of views and evidence, our additional empirical study seems worthwhile.

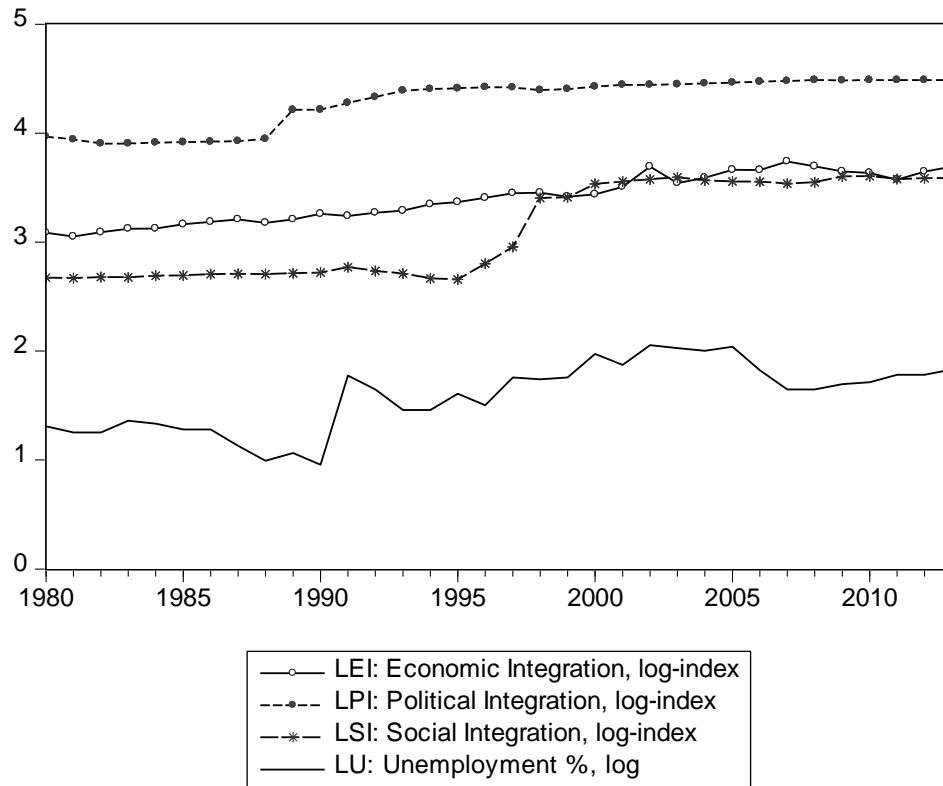
3: Data and Methodology

3.1 Data

We use annual time series data from 1980 to 2013 to investigate the impact of globalization on unemployment in Pakistan. Data on the unemployment rate are taken from the State Bank of Pakistan. Treating globalization as a multidimensional phenomenon, we use the KOF indices (Dreher, 2006; Dreher *et al.*, 2008) which measure three dimensions of a country's integration with the rest of the world: economic

integration, social integration, and political integration. Data for these indices are taken from <http://globalization.kof.ethz.ch>. The appendix shows a summary of the constituent series and their weights. Figure 1 graphs in logarithmic form: LEI (log of the economic integration index), LPI (log of the political integration index), LSI (log of the social integration index) and LU (log of the percentage unemployment rate).

Figure 1: globalization indices and unemployment, 1980 - 2013



3.2 Methodology

To guard against the risk of a fitted model implying predicted values for LU that exceed the feasible maximum, we define for modelling purposes an “unemployment logit”, i.e. the log of the unemployment odds ratio, as $LUO = \log(U/(100 - U))$, where U is the percentage unemployment rate.

It is well known that the appropriate approach for econometric modelling of time series data depends crucially upon the stationarity properties of those series. Where series are stationary then classical regression methods are appropriate but if the series have unit roots in their autoregressive representations then those classical methods become less

reliable since estimated regressions with good fit may actually be “spurious”. We therefore follow common practice by using the Augmented Dickey-Fuller (ADF) unit root test to investigate the stationarity properties of the series under consideration. Table 1 shows the p-values that result when the null hypothesis of non-stationarity (“unit root”) is tested¹ without a trend term – “ADF(C)”, and with a trend term – “ADF(C,T)”. (Lag lengths for the ADF test regressions were determined by minimization of the Schwarz information criterion (SIC).)

Table 1: p-values from ADF unit root testing, 1980 – 2013

	ADF(C)	ADF(C,T)
LEI	0.7944	0.1212
LPI	0.3591	0.9394
LSI	0.8807	0.2373
LUO	0.4172	0.2799

At first sight, the p-values in Table 1 suggest that the unit-root null hypothesis is to be accepted for all series, implying that the appropriate econometric methods are those devised for non-stationary series, for example estimation of an Error Correction Model (ECM) by Johansen’s method, as in Malik *et al.*, (2011). Further investigation, however, reveals that the conclusions for the economic integration measure (LEI) are sensitive to sample period. Table 2 shows the p-values resulting from the AD(C, T) test for various samples. Whilst LPI, LSI, LUO appear non-stationary for all samples, the result for LEI is sensitive to the choice of sample period.

Table 2: p-values from ADF(C, T) unit root testing, various samples

	1980 - 2009	1980 - 2010	1980 - 2011	1980 - 2012	1980 - 2013
LEI	0.0071	0.0258	0.2386	0.1448	0.1212
LPI	0.9058	0.9131	0.9234	0.9313	0.9394
LSI	0.2180	0.2157	0.2524	0.2425	0.2373
LUO	0.3051	0.3198	0.2942	0.2980	0.2799

Given the evidence of Table 2, we treat this as a situation where we cannot be confident that all series are integrated of order 1 (“I(1)”), i.e. requiring differencing in order to be

¹ Testing and estimation procedures have been conducted using Eviews v9

rendered stationary. Accordingly our model estimation follows the Auto-Regressive Distributed Lag (ARDL) technique developed in Pesaran and Shin (1999) and Pesaran *et al.* (2001) and summarized in Giles (2013). This approach is designed to be applicable where the data might contain I(0) series - stationary without differencing, as well as I(1) series.

The canonical form of an ARDL model is expressed in terms of current and lagged levels of the dependent and independent variables. Re-parameterization allows this to be re-written, for our case of three independent variables, as follows in (1). Here y_t is the dependent variable observed at time t , x_{it} is the i^{th} independent variable observed at the same time, and u_t is an accompanying error term. The net contribution of deterministic terms such as intercept and linear trend is represented by α_t .

$$\begin{aligned} \Delta y_t = & \alpha_t + \theta_0 y_{t-1} + \theta_1 x_{1,t-1} + \theta_2 x_{2,t-1} + \theta_3 x_{3,t-1} \\ & + \sum_{i=1}^{i=p_0} \beta_{0,i} \Delta y_{t-i} + \sum_{j=0}^{j=p_1} \beta_{1,j} \Delta x_{1,t-j} + \sum_{k=0}^{k=p_2} \beta_{2,k} \Delta x_{2,t-k} + \sum_{l=0}^{l=p_3} \beta_{3,l} \Delta x_{3,t-l} \\ & + u_t \end{aligned} \quad (1)$$

This parameterization supports testing of the null hypothesis that evolution of the variables in the model is not constrained by any equilibrium relationship between their levels, i.e. $H_0: \theta_0 = \theta_1 = \theta_2 = \theta_3 = 0$. If this hypothesis is rejected then the variables are “cointegrated”, implying that a self-equilibrating (“error correction”) restriction may be introduced into the model.

4: Empirical Results and Discussion

The first step is to check the assumption that none of the series are I(2) – still possessing a unit root after differencing. The results for unit root testing of the series in first differences are shown in Table 3; they imply rejection of the I(2) null hypothesis and so support proceeding under the assumption that all series are I(0) or I(1).

Table 3: p-values for unit root testing of differenced series

	ADF(C)	ADF(C.T)
LEI	0.0000	0.0000
LPI	0.0002	0.0011
LSI	0.0038	0.0204
LUO	0.0000	0.0000

Given that the data are judged to be a mix of I(0) and I(1) series, we can apply the “Bounds Test” of Pesaran and Shin (1999) to determine whether or not cointegration justifies imposing an error-correction restriction upon the ARDL coefficients. The Bounds Test is so called because lack of certainty regarding the order of integration of the variables implies a lack of certainty regarding the asymptotic critical values for the F-statistic used to test the “no cointegration” hypothesis, $H_0: \theta_0 = \theta_1 = \theta_2 = \theta_3 = 0$. Pesaran and Shin (1999) developed upper bounds for the critical values that apply if all variables are I(1) and lower bounds that are relevant if none are I(1). Where, as here, the variables are presumed to be a mixture of I(0) and I(1) series then the asymptotic critical values are not known but do lie between the known upper and lower bounds. In our case, the reported F-statistic (F=20.22) greatly exceeds the upper bound (5.23) of the critical value for testing at a 1% significance level and we can conclude that there appears to be a long-run cointegrating relationship between the series levels. Existence of this long-run equilibrium means that the ARDL model can be re-written in error-correction form, as in (2).

$$\begin{aligned}
 \Delta y_t &= -\gamma(y_{t-1} - \tilde{y}_{t-1}) \\
 + \sum_{i=1}^{i=p_0} \mu_{0,i} \Delta y_{t-i} &+ \sum_{j=0}^{j=p_1} \mu_{1,j} \Delta x_{1,t-j} + \sum_{k=0}^{k=p_2} \mu_{2,k} \Delta x_{2,t-k} + \sum_{l=0}^{l=p_3} \mu_{3,l} \Delta x_{3,t-l} \\
 &+ u_t \\
 \tilde{y}_{t-1} &= \delta_{0,t-1} + \delta_1 x_{1,t-1} + \delta_2 x_{2,t-1} + \delta_3 x_{3,t-1}
 \end{aligned} \tag{2}$$

In (2), long-run equilibrium is denoted \tilde{y}_{t-1} and $\delta_{0,t-1}$ represents deterministic contributions to this, such as intercept and trend. The parameter γ , which must be positive for stable equilibrium, measures the intensity with which departures from

equilibrium ($y_{t-1} - \tilde{y}_{t-1}$) prompt error-correcting responses in Δy_t – in our case the first difference of the unemployment logit, LUO. Since the independent variables are treated as exogenous in (2) the model does not predict a particular equilibrium level for y_t but does predict that the long-run steady state has $y_t = \tilde{y}_t$. Short-run movements around this steady state are influenced by the error term and the lagged differences in (2) as well as by the error correction mechanism.

For estimation of the ARDL model, the lag maxima (p_0, p_1, p_2, p_3) were each set to four years and, within these limits, the preferred model was selected according to the Schwarz Information Criterion. The levels form of the preferred model achieved an R^2 value of 0.96 and the residuals were free of statistically significant autocorrelation. The ECM representation of the preferred model is shown in Table 4, in which “D(ABC)” is the first difference of variable ABC and “D(ABC(-n))” lags the first difference by n years.

Table 4: estimated error-correction model

Dependent Variable: D(LUO)
 Selected Model: ARDL(2, 2, 2, 4)
 Sample: 1980 2013

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LUO(-1))	0.241779	0.089964	2.687512	0.0169
D(LEI)	-0.713455	0.287415	-2.482315	0.0254
D(LEI(-1))	1.188982	0.290808	4.088541	0.0010
D(LPI)	0.040104	0.315908	0.126949	0.9007
D(LPI(-1))	-3.421775	0.410192	-8.341894	0.0000
D(LSI)	0.658678	0.198891	3.311752	0.0047
D(LSI(-1))	-0.808999	0.203679	-3.971932	0.0012
D(LSI(-2))	-0.634326	0.215254	-2.946867	0.0100
D(LSI(-3))	-1.120671	0.206944	-5.415344	0.0001
C	-10.769997	0.951365	-11.320576	0.0000
E(-1)	-1.245118	0.110020	-11.317233	0.0000

E = LUO - (-2.3621*LEI + 2.2904*LPI + 1.4806*LSI -0.0362*TREND)

In Table 4, we see:

- there are statistically significant momentum effects – a positive coefficient on lagged changes in the unemployment logit;

- the immediate short-run impact of increasing economic integration is beneficial but this benefit is ephemeral, being cancelled out by lagged changes in the same aspect of globalization;
- increasing political integration has negligible immediate short-run impact but is beneficial after a one-year lag;
- increasing social integration induces increased unemployment initially but the lagged short-run effects are larger and beneficial

The estimated ARDL model is also informative regarding long-run consequences of globalisation. Firstly, the estimated coefficient on lagged departures from equilibrium, “E(-1)”, is negative, confirming that stabilizing error correction is present. With a stable steady state, we can meaningfully consider what would be the consequences of any persistent combination of the levels of economic, political and social integration. Table 5 reports that all three aspects of globalization have statistically significant coefficients in their estimated steady state relationship with unemployment. Considering the signs of the estimated coefficients, we find that a persistently high level of economic integration reduces the steady state unemployment rate but persistently high levels of the other two aspects of globalisation appear to have detrimental long-run effects.

Table 5: estimated long-run relationship between LUO and LEI, LPI, LSI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEI	-2.362058	0.724143	-3.261868	0.0053
LPI	2.290435	0.295082	7.762025	0.0000
LSI	1.480647	0.251680	5.883045	0.0000
TREND	-0.036223	0.007768	-4.662861	0.0003

The beneficial long-run effects of economic integration, coupled with the detrimental effects of political and social integration echo the results obtained with a different econometric approach by Malik *et al.* (2011). It would seem that, from the perspective of maintaining a low equilibrium rate of unemployment, a desirable development policy would encourage economic integration but seek to deter political and social integration. This proposition, however, begs the question of whether the several aspects of

globalisation evolve independently of each other. We now investigate this question by testing for cointegration between the three indices of globalisation. Panel A of Table 6 shows the F-statistics that result from testing the null of no cointegration with the three possible choices of left-hand-side (LHS) variable; panel B shows the upper and lower critical value bounds.

Table 6A: F-statistics for the null hypothesis of no cointegration between LEI, LPI, LSI

LHS variable	F
LEI	7.877
LPI	1.132
LSI	4.298

Table 6B: Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.63	3.35
5%	3.10	3.87
2.5%	3.55	4.38
1%	4.13	5.00

Following Pesaran and Shin (1999) we choose the preferred LHS variable according to the size of the F-statistic, selecting LEI on this basis. The F-statistic with LEI as the LHS variable (7.877) comfortably exceeds the upper bound for the critical value at a 1% significance level (5.00), providing strong support for the hypothesis of a long run relationship between the three aspects of globalisation. Put another way, the long run level for the index of economic integration is not independent of the levels of the indices of political and social integration. Table 7 reports that these two indices - LPI and LSI respectively, are both statistically significant in the estimated long-run relationship between the three measures of globalization.

Table 7: estimated long-run relationship between LEI and LPI, LSI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPI	0.346973	0.060754	5.711140	0.0000
LSI	0.338774	0.032378	10.462966	0.0000
C	0.898105	0.202355	4.438257	0.0002

For completeness, we check whether LPI and LSI themselves share a cointegrating relationship. Since these series have both been judged to be $I(1)$ – see Table 1 and Table 2, we can test for cointegration by methods that have well-defined asymptotic critical values and so we employ the well-known procedure of Engle and Granger (1987) which assesses the stationarity status of the residuals from a levels regression of one variable upon the other. We find that the p-value for the null hypothesis of a unit root in the residuals is 0.572 when LPI is regressed on LSI and 0.709 for LSI regressed on LPI. The levels regressions should therefore be judged “spurious” and we conclude that LPI and LSI are independent $I(1)$ series that do not cointegrate.

Substituting for LEI in terms of LPI, LSI allows the long-run relationship reported in Table 5 to be presented as (3) in which: LUO_t^{LR} is the predicted long-run equilibrium level for the unemployment logit at time t ; C_{LR} is an intercept term – undefined without additional identifying assumptions, because the ARDL model reported in Table 4 does not identify how the estimated intercept found there is distributed between the long-run and short-run portions of the model. LPI and LSI are the levels of social and political integration indices for which the long-run equilibrium is being defined.

$$LUO_t^{LR} = C_{LR} + 1.471LPI + 0.680LSI - 0.036t \quad (3)$$

Equation (3) predicts that globalisation overall tends to increase the expected long-run unemployment rate because of the influence of political and social aspects of globalisation. The counteracting influence of economic integration reported in Table 5 is taken into account in equation (3) but, because of the long-run dependency of economic integration on political and social integration, this counteracting influence cannot be sufficient to eliminate the increase in the long-run unemployment rate. This prediction is

mitigated to some extent by a negative time trend, suggesting that factors not included in the model have some ameliorating effect.

5: Summary and Conclusions

Using annual time series data for 1980 – 2013, we have empirically investigated the consequences of globalization for unemployment in Pakistan, taking into account the economic, political and social dimensions of globalization. To explicitly recognize the inherently fractional nature of the unemployment rate we have modelled the unemployment logit rather than the rate itself. Since unit root testing revealed some uncertainty regarding the stationarity status of the measure of economic integration, we have employed “ARDL bounds testing” to investigate the long-run and short-run effects of globalization.

We find that the short-run impact of globalisation is beneficial in the sense of reduced unemployment, though only marginally so with regards to the economic aspects of globalisation. The long-run story is distinctly different: political and social integration are both found to increase the long-run expected level of unemployment. (We do not attempt any explanation for this arguably unwelcome finding, leaving this as a matter for further research.) Although economic integration is beneficial in the long run, we find that it does not proceed independently of political and social integration and, for this reason, cannot exert so strong an influence as to make globalisation, overall, beneficial with regards to the unemployment rate in the long run.

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APPENDIX: KOF Indices, Variables and Weights

A: Economic Integration	[36%]	
i) Actual Flows	(50%)	
Trade (percent of GDP)		22%
Foreign Direct Investment, stocks (percent of GDP)		27%
Portfolio Investment (percent of GDP)		24%
Income Payments to Foreign Nationals (percent of GDP)		27%
ii) Restrictions	(50%)	
Hidden Import Barriers		23%
Mean Tariff Rate		28%
Taxes on International Trade (percent of current revenue)		26%
Capital Account Restrictions		23%
B: Social Integration	[37%]	
i) Data on Personal Contact	(33%)	
Telephone Traffic		26%
Transfers (percent of GDP)		2%
International Tourism		26%
Foreign Population (percent of total population)		21%
International letters (per capita)		25%
ii) Data on Information Flows	(35%)	
Internet Users (per 1000 people)		36%
Television (per 1000 people)		38%
Trade in Newspapers (percent of GDP)		26%
iii) Data on Cultural Proximity	(32%)	
Number of McDonald's Restaurants (per capita)		46%
Number of Ikea (per capita)		46%
Trade in books (percent of GDP)		7%

C: Political Integration	[27%]	
Embassies in Country		25%
Membership in International Organizations		27%
Participation in U.N. Security Council Missions		22%
International Treaties		26%

SOURCE: Dreher, Axel; Noel Gaston and Pim Martens, 2008, *Measuring Globalization - Gauging its Consequence*, New York: Springer.