Deindustrialization in South Asia: Role of Energy Crises

Bushra Yasmin and Wajeeha Qamar
Introduction

• The reduction in industrial capacity of the economy due to social and economic change is referred as deindustrialization.

• The contraction of agricultural and manufacturing sector and the emergence of the services sector is viewed as a natural outcome of economic development and rising living standards.

• Deindustrialization in developed world, since 1970s, is associated with higher productivity of the industrial sector however, in developing world, it is considered as premature and occurred at low level of per capita income.

• The energy crises along with the industrial policies and trade liberalization in South Asia may be the factors accountable for subordinating industrial sector growth of the region.
Objective

- The literature on the critical determinants of deindustrialization in developing countries focused on trade liberalization but no study has tried to investigate, specifically, the most threatening factor to industrial growth i.e., the energy crises that has been hampering the economic growth of South Asian countries for long.

The current study hence aims:

- To empirically investigate the extent to which the most significant component of energy i.e., electricity’s crises has played its role in the process of deindustrialization in Selected South Asian Countries, Pakistan, India and Sri Lanka over the time period 1971-2010.
Deindustrialization and Power Crisis: An Overview 1970-2010

Pakistan

• 1970s and 1980s: External factors reduced the manufacturing growth to 2.8 percent in 1970s while denationalization increased the value addition of industrial sector in GDP to 23.2 percent.

• The cost of production and demand of electricity were quite low in 70s and 80s, however, the demand pressure increased with the increase in population. And so was the case with energy prices.

• 1990s and 2000 onwards: Disappointing performance of industry in 90s due to liberalization reforms which created “anti-industrialization bias” while the performance was highly volatile in recent years due to law and order situation and energy crisis.

• 1994 and 2002 power policy focusing on privatization lead to accumulated circular debt in the economy as well.
India

• 1970s: Policy resolutions of 1973 and 1977 lead towards improvement however the oil price shock of 70s halted the process. The supply of electric power remained 10 percent less than the demand.

• 1980s: Loosening of controls, and a greater willingness to import technology and foreign private capital so average growth rate of industrial sector increased.
  – On the other hand, the power shortage of every megawatt resulted in the production loss of Rs 60 million in 1984.

• 1990s: Industrial licensing was abolished for most of the industries and the investment in the infrastructural development by private sector was encouraged. But, the electricity shortfall jumped to 30 percent in 1993.

• 2000s: Information Technology in the 2000s brought the revolution in Indian economy as the growth rate of industrial sector averaged to 8.1 percent for the decade.
  – However, India currently has an installed power generation capacity of 205,340 megawatts of electricity but it meets only 90% of total demand.
Sri Lanka

• 1970s: The industrial growth was estimated to be 3.7 percent in this decade despite export promotion due to oil crisis. In the power sector, there were no admirable developments as CEB was the sole supplier of electricity.

• 1980s: Incentives for foreign investment and liberalization reforms leading to 7.5 percent growth of industrial sector by the end of the decade.
  – Lanka Electric Company (LECO) was established in 1984 and Hydropower and the Thermal power remain the only source of power.

• 1990s: Witnessed a successful privatization program and the substantial foreign direct investment in the region due to institutional reforms. The power cuts of 1996 due to severe droughts urged the need for reforms in the electricity sector and a Power Sector Reforms Project (PSRP) was approved.

• 2000 onwards: Global financial and economic crisis lead to decline in industrial growth.
  – The CEB owned 75 percent of installed capacity while the IPPs owned rest of the 25 percent.
Methodology and Estimation Technique

- The regression equation used in this study is specified as below;

\[ IVAD_t = \alpha_0 + \beta_1 ELC_t + \beta_2 ELP_t + \beta_3 ELOSS_t + \beta_4 VOP_t + \beta_5 GX_t + \beta_6 GM_t + \beta_7 ENM_t + \beta_8 SVAD_t + \mu \]

- The Johansen Co-integration and the Error Correction Model are applied for estimation purpose.

- The Impulse Response Functions (IRFs) are obtained in order to observe the effect of one time shock to the selective variables on the deindustrialization time path for each country in the sample.

- The data from World Development Indicators (World Bank) is used over the time period of 1970-2010.
## VECM Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pakistan</th>
<th>India</th>
<th>Sri Lanka</th>
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<tbody>
<tr>
<td>SVAD</td>
<td>-2.41* (0.539)</td>
<td>-0.03 (0.142)</td>
<td>-0.237* (1.19)</td>
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<tr>
<td>ELC</td>
<td>-0.179* (0.03)</td>
<td>-0.076* (0.016)</td>
<td>-0.009* (0.006)</td>
</tr>
<tr>
<td>ELP</td>
<td>0.226* (0.05)</td>
<td>0.103* (0.021)</td>
<td>0.016* (0.007)</td>
</tr>
<tr>
<td>ELOSS</td>
<td>-0.057* (0.011)</td>
<td>-0.016* (0.004)</td>
<td>-0.005* (0.001)</td>
</tr>
<tr>
<td>VOP</td>
<td>-0.03* (0.016)</td>
<td>-0.01 (0.008)</td>
<td>0.003 (0.002)</td>
</tr>
<tr>
<td>GX</td>
<td>0.011* (0.001)</td>
<td>-0.092 (0.061)</td>
<td>-</td>
</tr>
<tr>
<td>GM</td>
<td>-</td>
<td>0.045 (0.150)</td>
<td>-0.019 (0.021)</td>
</tr>
<tr>
<td>ENM</td>
<td>1.66* (0.455)</td>
<td>-</td>
<td>0.221* (0.025)</td>
</tr>
<tr>
<td>ECT</td>
<td>0.016 (0.025)</td>
<td>-0.051* (0.03)</td>
<td>-0.406* (0.604)</td>
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<thead>
<tr>
<th>Diagnostic Test</th>
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<tbody>
<tr>
<td>Autocorrelation LM test</td>
<td>56.94 (0.722)</td>
<td>65.26 (0.433)</td>
<td>71.85 (0.23)</td>
</tr>
<tr>
<td>Normality Test</td>
<td>2.13 (0.976)</td>
<td>6.79 (0.559)</td>
<td>3.57 (0.89)</td>
</tr>
</tbody>
</table>
Results and Discussion

• The results postulate a significant long run relationship among energy sector variables and deindustrialization.

• A positive relationship between industrial value addition in GDP and electricity production

• A negative relationship between the electricity use and power loss in distribution and transmission and the industrial value added in GDP

• The findings of this study delink the service sector and industrial sector value added in the case of India while it appeared to be negatively significant for Pakistan and Sri Lanka with larger coefficient for Pakistan.

• The energy imports have a significant and positive impact on the industrial sector’s value added in Pakistan and Sri Lanka.

• The volatility in international oil prices appeared as negative and significant only in the case of Pakistan

• The Error Correction Term specifies a divergence from deindustrialization for its own accord. While for India and Sri Lanka, it postulate the stability and convergence in deindustrialization phenomena over the time.

• In Sri Lanka the correction to disequilibrium in industrial value addition is sharper i.e., 0.40 percent than of India where it will be adjusted by 0.05 percent each year.
• The Impulse Response Functions specifies:
  
  – IVAD becomes almost parallel to equilibrium line and shows no tendency to converge till the end of period selected for Pakistan after showing a slight decrease in first year after the shock.
  
  • The deindustrialization in Pakistan in the future largely depends on the historical patterns it has been following since years. Changing the declining phenomena of industrial value addition in GDP requires a continuous change in production process along with policy impetus.
  
  • The industrial value added follows a continuously increasing path in face of shock to international oil price volatility, exports growth and electricity generation.

  – The industrial value added in India has a permanent increasing trend when one standard deviation positive shock is given to its own, electricity consumption and generation. The magnitude of the effect of shock is substantial in case of electricity consumption.

  – For Sri Lanka, the industrial value added in response to its own shock emerged as persistent while the response to the service sector value added in GDP is not far from equilibrium.

  • After showing a slight increase in third year after the shock, the industrial value added becomes almost parallel to equilibrium line and shows no tendency to converge till the end of period selected.
Measures Adopted So Far

• Bangladesh and India have undertaken a mega coal-based power plant at Rampal with the capacity of around 1,300 MW.

• Pakistan has planned to import electricity from India and plans on the transmission line for power from Central Asia are also under consideration.

• The solar energy park in Cholistan is established with the help of Canada that is likely to produce 1,000 MW power after its completion and is expected to attract Rs 200 billion investment.

• The trade agreement on export of hydropower electricity between Pakistan, Afghanistan, Kyrgyz Republic and Tajikistan was signed for development of $ 1 billion 1227 km transmission line for delivering about 1,000 MW of electricity from the two central Asian States to Pakistan.

• According to National Energy Policy 2013, privatization of Gencos (generation companies) and Discos (distribution companies) is proposed with the national privatization plan of 64 public sector units.
Policy Recommendations

• A need to prioritize various energy policy points by the governments not only for the sake of resolving power crisis in the countries but also to trail back the countries on the sustained and self-sufficient industrial sector growth with an expanding services sector.

• Improvement in the power transmission and distribution system, proper management, control on power theft by harsh accountability and a convincing regulatory framework.

• To adopt energy mix and plan for development of non-conventional, alternative and renewable energy resources including solar, wind and tidal power.

• The regional cooperation can support the countries with significant energy import needs and can enhance energy security from the energy resource-surplus countries i.e., Nepal and Bhutan.
Pakistan can avail the ocean energy including thermal power, wave and tidal power.
   - This will help the economies disentangling from the high import bills and external debts.

The regional cooperation can play its immense role by easing tension among Pakistan and India.
   - The idea of combining resources is not far from reality but didn’t gain much attention due to political, geopolitical and the lack of infrastructures like cross-border transmission line across the countries

The regional trade is supported on the ground of lower cost due to the economies of scale, greater supply security and reliability