The Productivity Slowdown: Is Oil the Culprit? by Steven E. Plaut

One of the most controversial topics debated in the United States today is the cause of the productivity slowdown in recent years. This slowdown has been held accountable for falling personal incomes, higher inflation and unemployment rates, and a falling dollar. Slower productivity growth seems to be at the heart of the "reindustrialization" advocates for falling personal incomes, acea have been searching. Hardly a single advocate of the "reindustrialization" panacea has been searching. Nearly a single advocate of the "reindustrialization" panacea has been searching. Slowly a single advocate of the "reindustrialization" panacea has been searching.

Steven E. Plaut is a research associate, Federal Reserve Bank of St. Louis. This is in contrast to the views of most other authors.

The Productivity Mystery

On the surface, energy seems to be the most obvious explanation for the productivity slowdown. The stylized facts about energy prices are that oil prices had remained stable until 1973, then shot up rapidly following disruption of oil supplies in the first quarter of 1979. U.S. productivity fell by a 12.6 percent decrease in productivity followed sharp increases in oil prices. While oil prices had remained stable in real terms from 1976 to 1979, they shot up rapidly following disruption of oil supplies in the first quarter of 1979. This implies a $200 billion (1972 dollars) decrease in oil prices in 1972-75. As such, this commentary is in basic agreement with the work done by researchers at the Federal Reserve Bank of St. Louis. This is in contrast to the views of most other authors.

Table 1 Decline in Growth Rates of National Product per Hour Worked and Shares of Energy, by Sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Growth rate 1948-73</th>
<th>Growth rate 1973-76, post-oil price jump</th>
<th>Total input coefficient from oil and gas</th>
<th>Total input coefficient from manufacturing capital services, and sanitation services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>3.2</td>
<td>0.016</td>
<td>0.0010</td>
<td>0.0010</td>
</tr>
<tr>
<td>Construction</td>
<td>0.7</td>
<td>0.017</td>
<td>0.0152</td>
<td>0.0201</td>
</tr>
<tr>
<td>Services</td>
<td>1.2</td>
<td>0.0002</td>
<td>0.0001</td>
<td>0.0021</td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nondurable goods</td>
<td>2.7</td>
<td>0.0075</td>
<td>0.0020</td>
<td>0.0029</td>
</tr>
<tr>
<td>Wholesale, gas and light</td>
<td>Electricity</td>
<td>0.0120</td>
<td>0.0172</td>
<td>0.0172</td>
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<tr>
<td>Agriculture, forestry,</td>
<td>Manufacturing</td>
<td>0.0703</td>
<td>0.0273</td>
<td>0.0273</td>
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<tr>
<td>Mining</td>
<td></td>
<td>0.0303</td>
<td>0.0345</td>
<td>0.0345</td>
</tr>
<tr>
<td>All sectors in economy</td>
<td>2.9</td>
<td>0.0141</td>
<td>0.0494</td>
<td>0.0494</td>
</tr>
</tbody>
</table>


7. See Rasche and Tatom (14),[15],(16), and Tatom (18) and (18).
8. See Rasche and Tatom (14).
9. Steven E. Plaut is a research associate, Federal Reserve Bank of Cleveland, and assistant professor of economics, Oberlin College.

The decline in productivity growth was not confined to the United States. The year 1973 marks the point at which the decline in productivity growth spread from the United States to most of the major industrial countries. At the same time in major countries in the Organization for Economic Cooperation and Development, productivity growth slowed. In 1972-74, the countries responsible for the slowdown were Japan, West Germany, France, and Italy. In 1974, the United States was the country whose productivity slowdown was most obvious.
producing unit; when the price of imported energy rises, productivity falls—exactly as in the case of the simple factory. Extending this example, it can be argued that increases in prices of imported intermediate goods lead to contractions in the entire set of production choices for economies importing the good. This is equivalent to saying that the price increase leads to a contraction in output capacity and a decline in productivity for domestic capital and labor. A formula may be used to illustrate the relation between the long-run fall in productivity and the price change of any imported input. This decline in productivity would be observed after full adjustment of the economy. The formula treats capital and labor as one aggregate factor, but that is equivalent to investigating the "residual" change in productivity, after accounting for changes in the capital-labor ratio. In effect, capital and labor are "altered" when the price of imported energy rises, and they become less productive in both an average and a marginal sense.

The contraction in productivity is related to price changes by: 12

\[ \frac{\Delta P}{P} = \frac{\Delta LM}{LM} \] (f)

where \( P \) is the relative price of the imported input in question, \( \frac{\Delta P}{P} \) is the factor share of the imported input in domestic GNP, and \( \frac{\Delta LM}{LM} \) is the elasticity of substitution between the imported input and domestic value added. Rough estimates of the relevant variables can be substituted into equation 1. The percent increase in the price of imported oil for 1973-76 was about 1.17 percent. 13 The share of imported fuels in U.S. GNP averaged 1.17 percent between 1973 and 1976. 14 The elasticity of substitution between imported oil and domestic value added is unknown. However, the elasticity of substitution between all energy inputs and domestic factors has been estimated. 15

12. See Plaut [13].

13. This, of course, varied by types of crude. But the number is conservative, since one could argue that further price increases were anticipated. By mid-1980, oil prices were more than sevenfold above real costs.

14. The actual numbers were 0.96 percent, 1.16 percent, 1.32 percent, and 1.69 percent for the years beginning 1973, respectively. This refers to gross imports; the share of net imports was slightly less.

References
