
UNEMPLOYMENT

MACRO AND MICRO-ECONOMIC EXPLANATIONS

Edited by

LARS MATTHIESSEN and STEINAR STRØM

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This collection was originally published in
The Scandinavian Journal of Economics, Vol. 82, 1980, No. 2

First published in book form 1981 by
THE MACMILLAN PRESS LTD
London and Basingstoke
Companies and representatives
throughout the world

ISBN 0 333 31357 7

Printed in Hong Kong

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INTRODUCTION

Unemployment levels in most countries have been so high during the 1970s that we would have to go back several decades and a generation of economists to find a parallel. In the press and general political debate, economists have been accused of lacking explanations for this phenomenon. It has been asserted that no Keynes has appeared during the post-war period to lead the way out of the wilderness.

Even though no such new approach is prescribed in this special issue on unemployment, we believe that the paths indicated in this volume seem promising.

During the 1970s, the theoretical contributions aimed at explaining unemployment appeared in two fields which, to some extent, have several aspects in common. Fix-price models were applied in an attempt to penetrate simple, post-war macro models and thereby provide behavioral relations with a decision theoretic foundation. The plausibility of the assumption that prices are fixed may obviously be questioned, but there is hardly any doubt that fix-price models have given us new insight into the reasons why unemployment arises and what can be done about it. The second "new field" we would like to emphasize extended further into micro where analyses could be based on optimizing behavioral units in order to explain phenomena such as unemployment. The key concept in this field is job search theory.

Both of these fields are represented in this special issue. Part I, Macro, contains three papers based on fix-price models. *Erling Steigum* examines a fix-price, two-sector model of an open economy. This approach is a generalization in relation to the models which, until recently, were discussed in this field. It is shown e.g. that a fall in export prices results in Keynesian unemployment. Aggregate demand policy alone cannot curb unemployment. In fact, exaggerated use of this demand constraint propels the economy into classical unemployment. The remedy is a change in relative prices which can be attained through changes in wage rates and/or exchange rates. Similarly, *Per-Olov Johansson and Karl-Gustaf Löfgren* analyze a model of an economy with sticky prices. But unlike Steigum, in some instances Johansson and Löfgren allow exchange rates to vary. The main question is whether tariffs can be used to decrease employment. It is shown that the introduction of tariffs reduces aggregate employment under a flexible exchange rate regime, regardless of the

reasons why the economy deviates from Walrasian equilibrium. Under fixed exchange rates, however, the introduction of a tariff has the opposite effect, employment increases and unemployment is reduced. *Seppo Honkapohja and Takatoshi Ito* generalize the fix-price models of the 1970s by introducing uncertainty with respect to inventories, not as a means of holding wealth but as buffer stocks. Since prices do not instantaneously adjust to changes in market conditions, it seems reasonable that producers are engaged in both production and inventory adjustment. Three regimes are analyzed. The first is an economy with unemployment and an excess supply of labor without the possibility of a stock-out (Keynesian unemployment). The second regime is characterized by an excess demand for labor, but in conjunction with unemployment, and the possibility of a stock-out (underconsumption). The third combines an excess demand for labor with the condition that a stock-out is possible (repressed inflation). An important result of the model is that if expected demand is sufficiently small, the stationary state will lie in the region of Keynesian unemployment. The economy will oscillate around this level. In the opposite case, the stationary state will be in the region of repressed inflation and the economy will converge monotonically toward this state.

A common theme in many industrial countries, particularly during the 1970s, has been that people lose their jobs due to import competition from low-cost countries. This contention is not used to account for total unemployment in a country but rather as an explanation for job losses in certain exposed industries. From many quarters, protectionist measures have thus been proposed as a remedy. *Anne Krueger* analyzes this problem by means of data on the U.S. economy for the period 1970–1976 and finds that the hypothesis whereby job losses may be attributed to an increase in low-priced imports is not supported by the statistical evidence. Other processes brought about by economic growth and different income elasticities for goods, price elasticities, scale and substitution factors in the production of goods and services, etc. provide better explanations for shifts in employment than low-priced imports. Since protectionist measures lead to changes in relative prices so that capital-intensive processes become more profitable, it cannot be ruled out that protectionist measures will increase the relocation of labor.

As signified by the table of contents, the subject of the Phillips curve is still not exhausted. *Rolf Brunstad* bases his analysis on an economy with different labor markets (occupation, education, region) and a given distribution of excess demand for labor in these submarkets. The Phillips curve is derived. Changes in the distribution will alter the position of the curve and the level of the natural rate of unemployment. Market mechanisms aimed at inducing equilibrium in each submarket will shift the Phillips curve inwards and, at the same time, dampen inflation and unemployment. The Scandinavian type of trade unionism counteracts this process.

It is well known that countries which trade with one another exhibit a

tendency toward parallel variations in price and wage levels. When a country imports goods from another country, it also imports price increases. When a country exports to other countries, demand in these countries will affect the market situation, prices and wages in the exporting country. *Martin Paldam* introduces a new "international" variable to explain wage inflation in a country, i.e. wage increases in the other countries. He finds that wage inflation in other countries explains nearly half of the increase in wage rates in an observed importing country and thus much more than the increase which can be accounted for by imported price rises. Paldam classifies this factor as an international expectations indicator in the importing country's wage relations. Even though it might be difficult to accord this correlation an obvious and independent basis in economic theory, it is an interesting covariation, indicating that trade levels become relatively less important as an explanation for the distribution of inflation among countries.

Wilhelm Krelle uses a multinational equilibrium model to consider the reasons why unemployment rates differ among countries. Despite a long-run tendency for the supply of and demand for labor to grow by the same rate in all countries, unemployment always exists in each country during the course of development. The unemployed share of the labor supply can also vary among countries due to differences in technology, wage conditions, etc.

Part II, Micro, begins with an article by *Steven Lippman* and *John McCall*. Initially, they argue that one of the main causes of unemployment is imperfect information and a lack of incentives for individuals to obtain a job. Mismatch unemployment is a well known phenomenon in many countries and characterizes youth unemployment in particular. Neither employers nor employees have perfect information about how well suited an individual is for a specific job. Young workers, for example, change jobs more often than older people who are better established in their work. Lippman and McCall analyze waiting time, which consists of unemployment and temporary unemployment until permanent employment is obtained. One of their conclusions is that the length of each period of unemployment decreases when the probability of losing one's job increases but, at the same time, the number of times a job searcher is laid off increases. The effect of an increase in the probability of losing one's job on total waiting time is thus uncertain. As a result, the effects on search unemployment are also uncertain.

Lippman and McCall also analyze unemployment when a worker is temporarily laid off and when his is laid off without any chance of a recall. A laid-off worker is eligible for both unemployment insurance and other welfare benefits. The obvious economic problem in this context is how risk in the labor market should be allocated while maintaining the incentive to search. However, the authors also show that if unemployment insurance decreases with the length of spells of unemployment, the probability that a worker will return to employment increases.

Bertil Holmlund bases his study on search theory and estimates relations for vacancies, hiring, layoffs and quits. During the period 1974–1978, the Swedish economy—as so many others—encountered difficulties in finding markets for its export products. In order to maintain employment levels, the Swedish government implemented labor market measures aimed at preventing an increase in the number of unemployed. Holmlund uses an estimated labor market model to show that without these measures, unemployment in Sweden would have been 2–3 percentage points higher in 1978.

In discussions of youth unemployment, it has been claimed that there are less costs involved in keeping young people in school than in letting them be unemployed. But what about the incentives for youth to remain in the educational system and thus not look for work while in school? *Zvi Griliches* examines this question on the basis of data from the USA and finds that temporary interruptions do not entail any additional costs beyond those of having postponed the end of schooling by the length of the interruption. The young people in question work during the schooling interruption. There is no evidence in the data to indicate that work while in school is costly in terms of success in school or afterwards. A serious weakness in the data is that the sample is not random; not everyone returns to school after an interruption or is capable of work while in school.

In the literature, direct personal income taxes with high marginal tax rates have been emphasized as an important factor in explaining why people do not take jobs or in accounting for their work effort. But do taxes have other effects? *Arne Jon Isachsen* and *Steinar Strøm* study how taxation and possibilities of tax evasion can split the economy. An increased tax burden gives rise to expansion of the black labor market at the expense of the open labor market. Employment measures based on official labor market statistics which, by necessity, cover the open part of the economy, can easily be misinterpreted. Total employment might not have decreased, even though it may appear to have done so; instead, it increases correspondingly in the irregular labor market.

When discussing measures to reduce unemployment, the analyses in most of the papers in this special issue attach more importance to changes in relative prices as compared to the previous emphasis on regulation of aggregate demand during the last two decades.

Financial support from *Norges Banks Fond til Økonomisk Forskning* (The Bank of Norway Foundation for Economic Research) for publication of this issue of *The Scandinavian Journal of Economics* is gratefully acknowledged.

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PROTECTIONIST PRESSURES, IMPORTS AND EMPLOYMENT IN THE UNITED STATES

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Abstract

This paper assesses the theoretical and empirical basis for American labor union leaders' contention that imports have been a large source of job loss in the United States. It is shown, first, that identification of job losses "due to imports" is exceptionally difficult because economic growth affects adversely the industries believed affected by imports. Then, an accounting framework is employed to assess possible empirical orders of magnitude. The results are fairly conclusive in indicating that factors other than import competition have been primary in leading to structural shifts in employment.

I. Introduction

The American labor movement reversed its support of free trade in the 1960s, claiming and believing that "American jobs are lost" as a consequence of import competition. Its switch to a protectionist stance has been a significant force in American political discussions regarding trade policy. There can be little doubt that American adoption of such protectionist measures as trigger pricing for steel and the multifiber agreement was, in substantial measure, a consequence of labor pressures and the view of many other Americans that American labor was essentially correct in its beliefs. Advocates of free trade felt compelled to support "adjustment" assistance to "import-impacted workers" as part of their case.

It is the purpose of this paper to review the theory and empirical evidence underlying the view that job losses have, in some sense, resulted from import competition. The basic message is that, at least for the United States, it is exceptionally difficult to make an argument that job losses, however defined, have been "caused", in any substantial part, by import competition. Section II briefly sets forth conventional theory as to the possible relationship between imports and employment. Section III sets forth some empirical evidence about

* I am indebted to James M. Henderson for helpful discussions on the subject matter of this paper, and to Paitoon Wiboonchutikula for research assistance. The empirical results reported in Section III are drawn from Krueger (1979a and 1979b).

the changing composition of employment in U.S. manufacturing industry and the proximate decomposition of those changes into those generated by demand patterns, by productivity growth, and by imports or the net trade balance. A final section provides some indication as to the relative importance, within several allegedly trade-impacted industries, of gross and net employment changes in determining layoffs, and examines briefly the question of who gains, and who loses, in industries receiving protection.

II. How Can Imports Affect Employment?

Different economic theories have varying models of the underlying determinants of employment and wage determination. None of them assigns to imports (contrasted with the trade balance) a central role in the determination of employment.

At one extreme lies neoclassical theory, in which wages are fully flexible, so that the number of persons employed is a function of demand for, and supply of, labor. Any shift in the demand curve for labor is associated with a change in employment only insofar as the labor supply curve is not perfectly inelastic. When the demand curve for labor shifts upward, employment increases or decreases as the labor supply curve is forward sloping or backward bending. In the neoclassical model, import competition could affect employment and/or the real wage via the Stolper-Samuelson effect, with free trade resulting in a downward or upward shift in demand for labor, depending upon the relative factor intensity of imports and exports. If, as Leontief, Baldwin, Branson and Monoyios, and others have found American exports are relatively labor-intensive contrasted with American imports, theory would suggest that free trade would result in a higher real wage than would protection, and employment would be greater or less with free trade depending upon the sign of the slope of the labor supply curve.

At the opposite end of the spectrum is the simple IS-LM Keynesian model, in which the real wage is exogenously determined (via the price level or other means), and the level of aggregate demand determines the level of employment. In the model, fiscal and monetary policy determine the level of employment, and changes in imports are significant only insofar as they are not accompanied by changes in exports.

What all these models have in common is that they treat the level of employment as a macroeconomic phenomenon which, in the aggregate, it surely is. In addition, one cannot associate increases in imports with job losses unless one extends the analysis to take into account both the general equilibrium repercussions of the net increase in exports that would accompany any change in imports and also the underlying nature of the labor market (and in particular whether changes in the demand for labor are likely to be reflected in changes in the nominal or real wage rate). It is thus apparent that one cannot

legitimately view imports, or changes in import levels, as a significant determinant of aggregate employment.

What may make sense, however, is to examine “impact effects” on different industries of the changing pattern of trade. For, while aggregate employment levels are surely a function more of macroeconomic variables than of trade flows, it can be contended that import competition causes some individuals and firms to relocate either geographically or sectorally and that such relocation may cause hardships. If one is to make economic sense out of demands for protection on grounds of the “employment” effect of imports, it must surely be these “impact” effects, and the short-term dislocations that individual industries may suffer, that are the source of concern.¹

Even here, however, there are significant, and important, difficulties. For, as is well known, there are many causes of changes in employment composition. Changes in tastes and other random factors can result in an altered distribution of output and employment. Competitive successes and failures lead to changing patterns within, as well as between, industries. Perhaps even more important, the process of economic growth generates systematic changes in patterns of employment and output. This is both because: (1) income elasticities differ from unity, and employment must therefore shift from low-income-elasticity goods to high income-elasticity goods if the process of economic growth is to continue, and (2) factor accumulation, and especially accumulation of physical and human capital, alters the relative scarcity of different factors of production. As that happens, the real wage accruing to unskilled labor rises, while the real return to capital and skills falls relative to the return to unskilled labor. The change in relative factor prices, in turn, alters the relative costs of production in different lines, thus altering relative prices of final goods (unless, by chance, technological changes proceeds faster in relatively unskilled labor-intensive industries), and inducing consumers to substitute capital- and skill-intensive goods for unskilled-labor intensive goods in their consumption basket.²

That change must occur in the process of economic growth is widely accepted. Indeed, it would not be possible for rapid-growth industries to expand unless resources were released from contracting industries, and resistances to those changes would, by definition, retard the growth process. For present purposes, however, a major difficulty arises: for advanced countries such as the United States, the same labor-intensive industries that are likely to contract relatively because of rising real wages are the ones where import competition is most likely to be felt. This follows naturally from the factor proportions ex-

¹ Even if this argument proved to be valid and empirically significant, it would not constitute a convincing case for protections. The permanent consumption losses associated with failing to adjust would have to be evaluated against the short-term “gains” that stemmed from avoiding dislocation costs. On the size of those costs in the U.S., see Bale (1977).

² For an elaboration of this argument, and a simulation of the differential employment impact of capital deepening on labor- and capital-intensive industries, see Krueger (1979b).

planation of trade:¹ just as industries intensive in the use of unskilled labor are likely to be slowly growing because of their cost disadvantage with rising real wages, those same industries are likely to be at a competitive disadvantage vis-a-vis competition from imports, since the comparative advantage of the U.S. (and other advanced countries) is likely to lie in capital and skill-intensive goods.

Thus, the fact that the number of jobs in a certain labor-intensive industry may be declining is not per se evidence that imports are the "cause". To the extent that the foreign supply curve remains constant through the process, there is some presumption that the decline in employment is primarily a consequence of rising real wage rates and the process of reallocation of labor towards higher value-adding industries. In fact, if the foreign supply curve of imports is constant over time, it would be difficult to attribute employment declines to "import competition": at most, a case could be made that the presence of import competition prevented the domestic price from increasing as rapidly as it otherwise would have. In that sense, imports permit higher domestic consumption levels of labor-intensive goods than would otherwise be possible. Only a part of imports can be regarded as replacing domestic output in consumption.

The preceeding paragraph points up a major conceptual difficulty in attempting to estimate the "employment losses" attributable to imports: quite aside from general equilibrium problems, appropriate estimation would entail the specification of domestic demand and supply functions, and in addition would require estimation of the extent to which imports in a particular category increased moving along a foreign supply curve and the extent to which they rose because of shifts in foreign supply curves.²

It is these considerations which motivate the method of measurement used in the next section. Because of the deep-seated difficulties in identifying the extent to which it is factors associated with economic growth or it is imports that affect employment opportunities in laborintensive industries, an accounting framework is instead employed.

III. Accounting for the Sectoral Composition of American Manufacturing Employment Changes, 1970 to 1976

The period 1970 to 1976 was chosen for analysis for several reasons. On one hand, Frank (1977) has already analyzed the import-employment relation for

¹ Note, however, that it is not consistent with the Leontief finding that U.S. exports are capital-intensive relative to U.S. imports.

² There is another difficulty with the "imports cause job losses" argument: insofar as the domestic supply of import-competing goods is inelastic, increased imports would be met by a lower domestic price, with employment fairly constant. It is only if the supply curve of domestic labor-intensive goods is fairly elastic that one can argue sensitivity to foreign competition. But an elastic domestic supply presumably implies alternative uses of the factors of production.

the period 1963 to 1971, finding that the AFL-CIO claims for the impact of import levels on employment were greatly exaggerated and that, even for the three-digit industries for which imports were either largest or had grown most rapidly, rates of growth of demand and of labor productivity were significantly larger than import growth in affecting rates of change of employment. For present purposes, the year 1970, rather 1971, was chosen as an initial year for several reasons: (1) the existence of Frank's work covering the 1960s; (2) 1970 marked the year before dollar devaluation and is often pinpointed as the time when the large increase in imports started; and (3) because dollar devaluation took place in the middle of 1971, price statistics for 1971 to 1976 are somewhat less reliable than those for 1970 to 1976.

The choice of 1976 for a terminal year was affected by several factors: (1) it was the latest year for which data were available as of the time the computations were undertaken; (2) it was still a year of less-than—full-employment in the United States, so that concern with jobs and employment opportunities was perhaps better focused than was the case in the years 1977 and 1978 when the overall unemployment rate was lower; and (3) the price adjustments of 1974 and 1975 had a chance to work their way through the system, so that data for 1976 may better reflect underlying long-term factors than data for earlier years. It should be noted also that the 1970s were the period during which concern about import competition from the LDCs has been intense: focus upon the 1970–76 period should therefore enable a judgment as to its validity.¹

From the identity

$$C_{it} \equiv Q_{it} - X_{it} + M_{it} \quad (1)$$

where C_{it} is domestic utilization (for final private consumption, interindustry demand, inventory accumulation, other investment, and government use) of the i th good in period t , Q is domestic output, X is exports, and M is imports. All variables are measured in constant base-period prices. At any time t , labor has an average productivity:

$$\frac{Q_{it}}{L_{it}} \equiv a_{it} \quad (2)$$

where L_{it} is employment in the i th industry or sector and a_{it} is the average product of labor.

Define S_t as the ratio of domestic output to domestic consumption ($S_t \equiv Q_t/C_t$) and assume that the domestic share of output in consumption, S , labor pro-

¹ It should be noted, however, that the LDC share of imports into the OECD countries remained relatively small in 1976 and subsequent years. Manufactured exports from developing to industrialized countries in 1976 constituted 9.9 percent of total manufactured imports by industrialized countries, and only 1.6 percent of consumption of manufactured products in developed countries. See World Bank, *World Development Report* (1979, p. 21).

ductivity, a , and domestic utilization all grow (or decline) at constant continuous rates:

$$S_t = S_0 e^{\alpha t} \quad (3)$$

$$a_t = a_0 e^{\rho t} \quad (4)$$

$$C_t = C_0 e^{\beta t} \quad (5)$$

S_0 , S_t , a_0 , a_t , C_0 and C_t can all be ascertained from initial-year and terminal values, thus yielding solutions for the three rates of growth.

Employment, L_t , can then be expressed as:

$$\begin{aligned} L_t &= a_t^{-1} S_t C_t = a_0^{-1} e^{-\rho t} S_0 e^{\alpha t} C_0 e^{\beta t} \\ &= E_0 e^{(\beta + \alpha - \rho)t} \end{aligned}$$

The rate of growth of employment is thus expressed as the sum of three components: the growth rate of domestic consumption,¹ the growth rate of the share of domestic output in domestic consumption, and (minus) the growth rate of labor productivity.² A negative sign for α , for example, indicates that the share of domestic consumption met by domestic production declined, and α can be interpreted as the additional continuous rate of growth in employment that would have been attained had the share of domestic output in domestic consumption remained constant, *ALL ELSE UNCHANGED*. For reasons spelled out above, it is not at all evident that all else would have remained unchanged, so that the interpretation of α must be purely definitional. In a closed economy, α would be zero by definition. However, the growth rates β and ρ would very likely be different, even given the same underlying tastes, production functions and factor endowments as in the open economy case.³

Using these relations, data were collected for 1970 and 1976. Despite the apparent simplicity of the accounting framework, there is nothing simple about data collection: trade statistics are on a commodity basis, output and employment statistics are on an industry basis, and price statistics are compiled on yet a third basis. Considerable effort is involved in reconciling these three groups of data.⁴

¹ Domestic consumption is defined alternatively as domestic production plus imports (which implicitly includes exports as part of domestic demand) and domestic production plus imports less exports. Comparison of the two sets of results permits a contrast between the gross sectoral effect and the net effect.

² Alternatively, one could compute time trends from regression equations and use them to calculate rates in Equation (6). The difficulties of gathering the data precluded such an effort.

³ It should be noted that β cannot be interpreted simply as the rate of upward shift in the demand curve: whatever price changes occurred during the period under analysis would affect the estimated rate of growth of utilization, and β links observed utilization levels. Only if price had remained unchanged would β reflect the rate of upward shift of the demand curve. Even then, the rate of growth of real income might well differ in a closed economy, so that β would differ on that reason.

⁴ The interested reader is referred to Krueger (1979a) for particulars with regard to the

Table 1. *U.S. rates of growth of demand, labor productivity, import share and employment, 1970 to 1976*

Continuous percentage rates

Industry		Demand growth (1)	Labor productivity (2)	Imports (3)	Net trade balance (= X - M) (4)	Employment (5)
SIC code	Name					
20	Food products	1.30	-1.68	-0.02	-0.13	-0.41
21	Tobacco products	1.32	-1.78	-0.05	-0.38	-0.51
22	Textile mill products	-0.20	-0.47	0.09	0.43	-0.58
23	Apparel	3.03	-2.68	-0.96	-0.77	-0.62
24	Lumber products	-1.16	4.20	-0.18	-0.19	2.85
25	Furniture & fixtures	1.41	-1.56	-0.24	0.09	-0.39
26	Paper & paper products	2.16	-2.48	-0.13	-0.01	-0.45
28	Chemicals	1.80	-1.56	-0.20	-0.08	0.04
29	Petroleum & coal products	2.68	-1.78	-0.43	0.59	0.47
30	Rubber & plastic products	3.87	-1.20	-0.30	-0.06	2.37
31	Leather products	-0.60	0.38	-1.51	-1.27	-1.73
32	Stone, clay & glass products	0.18	0.38	-0.11	-0.05	0.45
33	Primary metals	0.01	-0.79	-0.23	-0.42	-0.92
34	Fabricated metal products	2.32	0.17	-0.16	-0.18	2.33
35	Non-electric machinery	2.81	-0.54	-0.32	-0.55	1.95
36	Electrical & electronic equipment	2.20	-2.12	-0.90	-0.14	-0.82
37	Transportation equipment	2.04	-0.92	-0.64	-0.23	0.48
38	Instruments	7.75	-2.12	-0.56	-0.28	5.08
39	Miscellaneous manufacturing	2.66	-2.12	-0.58	0.01	-0.04

Source: Department of Commerce Bureau of the U.S. Census, *U.S. Commodity Exports and Imports as Related to Output 1970 and 1969 and 1976 and 1975*. Annual Survey of Manufactures, 1970 and 1976. Output and trade data for 1976 were deflated by the Department of Commerce 2-digit SIC deflators contained in Wholesale Prices and Price Indices Data for January 1977, Data for January 1971, and December 1976 figures were used.

Table 1 gives the continuous rates of growth of consumption (utilization), labor productivity, imports, the net trade balance, and employment derived by the procedures described above. By definition, the sum of the first three columns equals the last column. For non-electrical machinery, for example, the rate of growth of domestic utilization (defined as domestic consumption

data sources. Obtaining reliable price deflators is perhaps the most difficult task, but any errors in those estimates are reflected in both labor productivity and demand, and thus do not affect the estimate of α . Printing and publishing was omitted for lack of an appropriate price index.

plus imports) was 2.81 percent continuously, while labor productivity grew 0.54 percent and the share of domestic output in domestic utilization fell at a continuous rate of 0.32 percent. Employment grew at an annual average rate of 1.95 percent (equal to 2.81 minus 0.54 minus 0.32). To state it another way: had imports grown at the same rate as domestic production while domestic utilization and labor productivity followed their actual growth paths, employment would have increased at a continuous rate 0.32 percent faster than the realized one. If net trade balance, rather than imports, is used, employment and labor productivity growth rates are unaffected. Thus, "true" domestic utilization can be derived by adding the difference between the trade balance rate and the import rate to the domestic demand growth rates. For example, for electrical and electronic equipment the import share decreased at a rate of -0.90 percent while the share of the net trade balance declined at a rate of -0.14 percent. Thus, part of the increase in imports was offset by growth of exports, and the growth of domestic utilization, defined as $Q + M - X$, was 1.44 percent annually ($2.20 - 0.90 + 0.14$).

Examination of the data in Table 1 suggests that rates of change in domestic demand and labor productivity were quantitatively larger than the rate of growth of import share in all two digit sectors except for leather, even without taking into account the behavior of exports in the same sectors. Moreover, in only three sectors—electrical and electronic equipment, apparel, and miscellaneous manufactures—in which employment declined could employment have grown with a constant import share even if demand and labor productivity had followed their actual course.

These conclusions emerge even more strongly if the net trade balance column, rather than the import column, is examined. For miscellaneous manufacturing, the increase in exports was sufficient to change the sign of the trade effect.

It thus seems difficult to attach much credence, at the two-digit level, to the arguments that imports have significantly impacted employment. There are two objections that have been raised to that conclusion. On one hand, proponents of protection have asserted that increases in labor productivity may be associated with import competition; on the other hand, it can be argued that more disaggregated data would tell a different story.

The first argument—that increasing imports result in increased rates of labor productivity growth—is difficult to evaluate. If it is true, it would significantly increase the welfare losses associated with any protectionist measures. It is not, therefore, necessarily an argument in favor of protection. At the two-digit level, however, there does not appear to be any simple relationship between productivity growth rates and imports: a regression of the rate of growth of labor productivity on the rate of growth of imports (from the data in Table 1) yields a negative (-0.03) but statistically insignificant coefficient. It seems equally plausible that increased imports might spur domestic entrepreneurs to a greater efficiency, and that industries with slow rates of

productivity growth (and therefore above-average rates of increases in price) would be the ones most likely affected by import competition. There is no compelling reason why causation should be the same in all industries. While further research might yield fruitful results in clarifying the relationship between import competition and domestic efficiency, it seems reasonable to conclude that the productivity-import competition argument can go either way and is certainly not well enough documented to serve as a basis for either a free trade or a protectionist case given the present state of knowledge.

The second argument—that two-digit industries are not sufficiently disaggregated—has more appeal. It should be noted, however, that the more disaggregated the industry, the higher in absolute value the price elasticity of demand facing it is likely to be. To that extent, even where import competition appears to be a significant factor, there is a question about the extent to which protection would result in increased domestic production levels, rather than reduced domestic consumption levels.

Nonetheless, in an attempt to evaluate the contention, the available data were collected on four-digit subsectors of the two-digit industries: textiles, apparel, leather products, and electrical and electronic equipment. These are the four sectors which are most widely regarded as having experienced significant dislocation due to import competition. Unfortunately, the necessity to obtain price deflators becomes increasingly difficult as the definition of an industry narrows, and the number of subsectors for which it was possible to estimate output, trade and employment levels was not large. Table 2 presents the results.

As can be seen, the variation in employment growth rates across four-digit industries is, as would be expected, considerably larger than for two-digit sectors. Nonetheless, the general impression remains much the same: demand and labor productivity growth rates, and not imports, have been the dominant factor in affecting rates of employment growth. Of the 42 four-digit industries for which data were available, there were 12 which experienced rates of employment decline in excess of 3 percent. In only one of those was the rate of increase of the import share in excess of 1.33, and that was radio and TV sets, where employment decreased 3.72 percent at a continuous annual rate, while the import share rose at a rate of 3.20 percent. For the four-digit industry with the most rapid rate of employment decline (electronic receiving tubes), the industry experienced declining demand at a rate of 12.1 percent, increased labor productivity at 7.45 percent, and an increased import share at 1.32 percent.

Although the data are not conclusive because of the absence of appropriate data for other subsectors, the evidence seems fairly strong that even at the four-digit level, it cannot be so that protection, or reduction of imports, could in any major part have offset the tendency toward reduced employment levels at the four-digit level. Production growth and demand patterns were far too large relative to the growth rate of imports.