The Muddles over Outsourcing

Jagdish Bhagwati, Arvind Panagariya and
T.N. Srinivasan

I n the early 1980s, "outsourcing" typically referred to the situation when firms expanded their purchases of manufactured physical inputs, like car companies that purchased window cranks and seat fabrics from outside the firm rather than making them inside. But in 2004, outsourcing took on a different meaning. It referred now to a specific segment of the growing international trade in services. This segment consists of arm's-length, or what Bhagwati (1984) called "long-distance," purchase of services abroad, principally, but not necessarily, via electronic mediums such as the telephone, fax and the Internet. Outsourcing can happen both though transactions by firms, like phone call centers staffed in Bangalore to serve customers in New York and x-rays transmitted digitally from Boston to be read in Bombay, or with direct consumption purchases by individuals, like when someone hires an offshore firm to provide plans for redesigning or redecorating a living room.

Thus, in February 2004, the members of President Bush's Council of Economic Advisers stated the following: "Outsourcing of professional services is a prominent example of a new type of trade" (Mankiw, Forbes and Rosen, 2004). The chair of the CEA, Gregory Mankiw, made a similar point in a press interview (Andrews, 2004): "I think outsourcing is a growing phenomenon, but it's something that we should realize is probably a plus for the economy in the long run. We're very used to goods being produced abroad and being shipped here on ships or planes. What we are not used to is services being produced abroad and being sent here over the

■ *Jagdish Bhagwati is University Professor, Columbia University, and Senior Fellow in International Economics, Council on Foreign Relations, both in New York, New York. Arvind Panagariya is a Professor of Economics and the Jagdish Bhagwati Professor of Indian Political Economy, Columbia University, New York, New York. T.N. Srinivasan is Samuel Park Jr. Professor of Economics, Yale University, New Haven, Connecticut.*

Internet or telephone wires. But does it matter from an economic standpoint whether values of items produced abroad come on planes and ships or over fiber-optic cables? Well, no, the economics is basically the same."

Mankiw's comments caused a considerable stir, with critics complaining that he had endorsed a reduction in U.S. jobs. Journalists jumped on the bandwagon, with Lou Dobbs of CNN going so far as to list on his program U.S. companies that "ship jobs abroad." Many Americans had similar concerns; for example, an Associated Press-Ipsos poll in May 2004 found that 69 percent of Americans thought that "outsourcing" hurts the U.S. economy, against only 17 percent who think it helps (reported at ⟨http://www.pollingreport.com/trade.htm⟩).

The resulting public debate over outsourcing has been marred by two sets of serious muddles. The first set of muddles relates to what is meant by outsourcing. When many politicians, journalists and even some economists start discussing "outsourcing," they soon leap beyond purchases of offshore arm's-length services to include, without analytical clarity, phenomena such as offshore purchases of manufactured components and even direct foreign investment by firms. Thus, we begin by discussing how outsourcing, properly defined as the offshore trade in arm's-length services, is addressed in the World Trade Organization in its General Agreement on Trade in Services. Based on this definition, we then discuss recent estimates of the extent of outsourcing.

The second set of muddles is more subtle: even some economists who use the appropriate definition of outsourcing sometimes worry about whether arm's-length trade in services should be treated with the same analytical tools as trade in goods, or whether it presents different issues. We present some models to illustrate the effects of outsourcing, and we use the models to consider how trade in offshore purchase of such arm's-length services might affect national output, wages and distribution of income. We argue that outsourcing is fundamentally just a trade phenomenon; that is, subject to the usual theoretical *caveats* and practical responses, outsourcing leads to gains from trade, and its effects on jobs and wages are not qualitatively different from those of conventional trade in goods. We also distinguish between outsourcing issues arising in two alternative ways: first, because of new technological possibilities that convert previously nontraded services into traded arm's-length services (at any given skills and factor endowments of countries) and, second, as skills accumulate in countries such as India and China in information technology activities that can augment internationally traded arm's-length services (at any given technology for trading such services).

Muddles over the Definition of Outsourcing

The economics literature on trade in services has long made distinctions based on the different ways in which the provider and the user could transact. For example, Bhagwati (1984) distinguished between "long-distance" arm's-length ser-

vices and those requiring the provider and the user to get together.[1] Sampson and Snape (1985) offered further distinctions in the latter group. The language of the World Trade Organization (WTO), under its General Agreement on Trade in Services (GATS), categorizes four different ways in which services can be traded.

In Mode 1 of the WTO terminology, trade in services involves arm's-length supply of services, with the supplier and buyer remaining in their respective locations. Although Mode 1 purchases have come into prominence because of the advances in electronic information and communications technology that allow rapid flow of voluminous data across international boundaries, such transactions also take place through conventional communications; for example, accounting work for a firm in New York can be done in Bangalore with records going back and forth by snail-mail. Mode 1 trade in services is generally distinguished from goods trade in that it cannot be readily subjected to customs inspection. Both individuals and firms can provide Mode 1 services. In the former category, we have independent designers, architects and consultants who sell their services electronically to manufacturers and consumers around the world. In the latter, we have large firms that manage call centers, back offices and software programmers.

Mode 2 services are provided by moving the service recipient to the location of the service provider. Travel by foreign residents including tourists is the dominant form of Mode 2 exports and contributed $64.5 billion to the U.S. services exports in 2003, according to the U.S. Bureau of Economic Analysis (⟨http://www.bea.gov/bea/di/home/bop.htm⟩). Other examples of Mode 2 exports include medical care rendered to foreign patients and education provided to foreign students. The latter generated as much as $13.4 billion in export revenues for the United States in 2003.

In Mode 3, the service provider establishes a commercial presence in another country, requiring an element of direct foreign investment. The direct investment involved is assumed to be minuscule, existing only to facilitate sales and purchases. The most prominent examples of Mode 3 services are banking and insurance. Mode 3 is therefore held to entail only the "right to establish," to distinguish it from full-scale direct investment.

In Mode 4, the service seller moves to the location of the service buyer. Construction and consulting services are often provided through this mode. Also included in this category are medical and educational services provided by moving doctors and teachers to the location of the recipient. Thus, Mode 4 implies temporary migration, which can shade over into permanent migration, since the experience with the guestworker (*gastarbeiter*) program in western Europe has shown that it can be enormously difficult to return temporary workers to their countries of origin. As the Swiss novelist Max Frisch remarked movingly when the German authorities could not bring themselves to return guestworkers to their

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[1] Bhagwati (1984) also initiated the analysis of what he called "splintering" of services from manufacturing. Splintering occurs when part of the manufacturing value added, such as, say, painting a car, is done by contracting it out to a separate painting firm, and the painting value added then becomes part of the service sector, with little change in the overall real situation. Some economists now call this the "fragmentation" phenomenon.

countries of origin in the distressed economic times of the 1970s, "We imported workers and got men instead."

Trade in Mode 1 services is what most economists have meant when they discuss "outsourcing." Moreover, international trade in tourism (Mode 2), banking and insurance (Mode 3) and programs of temporary or permanent migration (Mode 4) present distinctive issues of their own, so that Mode 1 trade in services is the primary focus of this article. But it is worth noting the historical irony that when trade in services was brought into the fold of international trade rules via the General Agreement on Trade in Services (GATS), concluded as a part of the Uruguay Round Agreements that created the World Trade Organization (WTO) in 1995, trade in Mode 1 services was the least controversial, while Modes 3 and 4 were the most controversial. The developed countries demanded the expansion of the right to commercial presence abroad (Mode 3) and opposed the inward movement of people (Mode 4). Developing countries, on the other hand, resisted liberalization in Mode 3 services and pushed for the liberalization of Mode 4 services, which offers their unskilled populations the possibility of offering services in developed countries. Neither side showed much resistance to the Mode 1 cross-border trade in services, perhaps because by definition, it did not involve accepting a foreign presence on one's soil. Indeed, the bulk of the liberalization commitments made as a part of the GATS negotiations under the Uruguay Round were under Mode 1. In the years immediately following the creation of the WTO in 1995, the United States aggressively pushed the idea that the WTO members commit to zero duty on Internet trade.

In the public controversy over outsourcing and its effects on American prosperity, jobs and wages, at least two phenomena have been muddled up with the purchase of long-distance services à la Mode 1 of WTO, making the discussion of the outsourcing phenomenon opaque and misleading, to say the least.

First, the public outcry often slides over into imports of all services, not just Mode 1 services. Sometimes the critics of outsourcing appear to include even the imports by firms of manufacturing components, as under the early-1980s definition of "outsourcing." In fact, such enlargement of the scope of the phenomenon of outsourcing should include imports of products for final consumption as well: after all, there is no difference in principle between an American factory owner importing French brie and Burgundy for his supper, instead of consuming Milwaukee beer and Kraft cheese, and his importing a Japanese lathe rather than one manufactured in Ohio for his factory in Youngstown. Second, the phenomenon of direct foreign investment is often added indiscriminately to the discussion of outsourcing of Mode 1 services, as when a firm closes its plant in Boston and invests in production in Bombay, or when a firm simply opens up a factory in Nairobi instead of in Nantucket.[2] This confuses the phenomenon of trade in services with direct foreign investment.

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[2] For a prominent recent example of expanding the definition of "outsourcing" to include other forms of trade, see Dobbs (2004), the jacket of whose book, *Exporting America*, condemns that "Employment in the auto industry has dropped by 200,000 jobs over the past four years, while imports of Chinese auto

But direct foreign investment is *not* the same as offshore outsourcing, even though sometimes both phenomena are tied together as, for example, when Dell invests in an outsourcing facility for call answering in Bangalore. The two phenomena are both empirically and analytically distinct. The pros and cons of direct foreign investment are much discussed in the massive academic literature on the subject. It would be fair to say that today direct foreign investment is considered to be desirable, even if the gains from it to the recipient and to the sending countries need not always be substantial and occasionally a downside can occur.[3] Regardless, we will ignore this question, concentrating instead on analyzing outsourcing of Mode 1 services, as defined and distinguished above.

How Many U.S. Jobs Have Been Outsourced?

Despite the heated level of rhetoric over outsourcing, the magnitude of jobs affected by outsourcing of Mode 1 services in the U.S. economy appears quite modest. The smallness of the number emerges whether we look at the buyer's side of the transaction or that of the seller.

On the buyer's side, perhaps the most frequently cited estimate is due to a 2002 report from Forrester Research, Inc., authored by McCarthy (2002), according to which the total number of U.S. jobs outsourced will reach 3.3 million—recently revised to 3.4 million in McCarthy (2004)—by 2015. Forrester does not explain whether the prediction is that the U.S. economy will have 3.3 million fewer jobs in 2015 than it would otherwise have had because of outsourcing, which seems implausible given the common belief among economists that the number of jobs in the long run is determined by the natural rate of unemployment, or whether the prediction is that outsourcing will cause 3.3 million U.S. workers to shift from jobs that they might otherwise have had into different jobs, which is a more plausible claim. Nor does this report focus on just Mode 1 services, so in that sense the estimate for outsourcing is likely to be overstated.

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parts have doubled." Similarly, Dobbs complains on the flap of his book jacket: "Carrier, maker of air-conditioning and heating units, closes its Syracuse, New York, plants—and most of its 1,200 jobs go to Singapore and Malaysia." Politicians on all sides make similar conceptual errors. For example, John Kerry's website advocates "Close Loopholes In International Tax Law That Encourage Outsourcing," and the surrounding discussion makes clear that "outsourcing" covers any company with a foreign subsidiary (<http://www.johnkerry.com/issues/economy/jobs.html>, accessed September 2, 2004). Matching this confusion, Republicans like U.S. Senate Majority Leader Bill Frist have struck back at the critics of outsourcing by highlighting the number of major foreign companies like Nissan who "insource," that is, build manufacturing plants in the United States (for examples, see <http://www.ofii.org/facts_figures/>). Whatever the merits of such arguments about foreign subsidiaries and the location of manufacturing, it is conceptually quite different from Mode 1 trade in services.

[3] The voluminous literature has been reviewed by many, including Richard Caves (1996), a principal researcher in this area. A review and assessment from the perspectives of civil-society complaints about direct foreign investment, including whether multinationals exploit foreign workers in poor countries, can be found in Bhagwati (2004).

But even accepting these estimates at face value, Forrester is suggesting an average annual outflow of jobs of at most 300,000 (without any offset for the inflow of jobs due to outsourcing by other nations from the United States). The Forrester report associates this outflow with nine occupational categories—for example, management, architecture and engineering and computer and mathematical operation—identified as especially subject to outsourcing. The estimated number of jobs affected turns out to be a minuscule 0.53 percent of the 56.7 million jobs in 2002 in these nine occupational categories.[4] Alternatively, considering that the U.S. economy destroyed as many as 30 million jobs in 2003 and created approximately as many of them, according to the Business Employment Dynamics survey of the Bureau of Labor statistics at ⟨http://www.bls.gov/bdm/home.htm⟩, the Forrester estimate of job outflows is about 1 percent of the number of jobs destroyed and created annually currently.

Evidence on job losses from yet other sources reinforces the conclusion that the aggregate effect of outsourcing has so far been negligible. Companies that lay off 50 workers or more are asked by the U.S. Department of Labor to explain the reason. Only 2 percent of the layoffs in the past five years are reported to have come from companies reallocating operations overseas or from import-competition pressure. Evidently, Mode 1 outsourcing of services must be only a small part of these 2 percent of the total layoffs.

Likewise, Mann (2003) calculates that once we cut through the dotcom boom and bust, adjust for the business cycle downturn and compare more meaningfully therefore the employment in the information technology-related industries during end-1999 to October 2003, employment in architecture and engineering occupations is stable, in computer and mathematical occupations is 6 percent higher and in business and financial occupations is 9 percent higher. These figures do not directly measure the extent of outsourcing, but insofar as the occupational categories they represent are the ones subject to outsourcing, a stable or rising employment trend in them suggests relatively little impact of outsourcing on employment.

The number of outsourced jobs can also be measured from the seller's side. India is by far the largest provider to date of offshore Mode 1 services. According to India's National Association of Software and Service Companies (NASSCOM), employment of workers such as software developers and call center operators serving clients outside India increased by 353,000 between March 2000 and March 2004, reaching 505,000. Of the increase, 70 percent or 247,000 workers went into serving clients in the United States. This works out to 61,750 jobs per year. In the Philippines, the increase in the number of workers doing back-office work for

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[4] Kirkegaard (2003) offers a detailed and careful analysis of the job losses in the nine occupational categories between 2000 and 2002. Though manufacturing accounted for less than 10 percent of employment in these categories, it accounted for the vast majority of the job losses in them. Services experienced a net gain in jobs in the categories. Among the nine occupational categories, management accounted for 60 percent of the job losses.

non-Philippine companies between 2002 and 2003 was 14,500.[5] Adding up these numbers and accounting for some missing countries and categories, it is unlikely that the number of workers engaged in providing offshore services to the United States companies could have averaged more than 90,000 to 100,000 per year.

Moreover, even if outsourcing sometimes reduces jobs proximately at certain firms or in certain sectors, in other cases it can help to create new U.S. jobs. This happens when the availability of the cheaper lower-end skilled workers abroad makes an activity that also uses higher-end skilled workers in the United States financially feasible. For example, the Information Management Consultants (IMC) of Reston, Virginia, several years ago considered producing software that would allow biotech companies to exploit better the new human genome research. The project seemed financially nonviable if undertaken entirely in the United States. But having its Indian subsidiary do the bulk of the coding work made the project viable. The outcome was a thriving line of business in bio-informatics for IMC and employment at six-figure salaries in the United States. For each engineer in India, the firm now employs six engineers in the United States (Pearlstein, 2004).

Moreover, any proximate job losses due to outsourcing from the United States must be set against the proximate job gains due to others outsourcing to the United States. The United States is a substantial exporter of services in fields as diverse as legal, medical and accounting services. These include outsourcing of Mode 1 services, of course. We analyze more fully below the consequences of outsourcing for jobs in the United States, but we may remark here that while linking sectoral trade balances to aggregate jobs is inappropriate on theoretical grounds, if we were to disregard this *caveat* and join the policy debate on whether we proximately export more service jobs than we import, the large U.S. trade surplus in services—$51.1 billion in 2003 according to the U.S. Bureau of Economic Analysis—surely has to favor outsourcing. Since the U.S. economy offers high-value Mode 1 services while importing low-value ones instead, the net trade balance in Mode 1 services is also almost certainly in America's favor, just as it is on services more generally.

Given then the meager evidence that outsourcing has been or will be quantitatively important in U.S. labor markets, why has the issue risen to such prominence? One answer is that stagnant job growth since the recession of 2001 has led to a search for possible causes. This attempt to draw a connection between international trade in services and slow U.S. job growth in the early 2000s is surely linked to the crude and incorrect view often used by protectionists that all imports, whether of goods or services, cause a "loss of jobs" for Americans. These complaints reduce to the conventional witticism: Trade is good but imports are bad. This fallacy is, of course, all too pervasive; but it has regained popularity at a time when trade deficits are large and job generation has been slow. Another reason for the

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[5] We take the numbers cited in this paragraph so far from the Hilsenrath (2004) story in the *Wall Street Journal*. He also says that, in Ireland, the number of jobs created by U.S. multinationals between 2002 and 2003 was only 1,139 per year; but these numbers relate to direct foreign investment rather than outsourcing.

furor over outsourcing is that the technological advances in computing, commu-nications and information technology have made the outsourcing of services a practical possibility in a way that was not possible in the past, creating fear of job loss among white-collared workers. A presidential election campaign in 2004 added intensity to this volatile mix of ingredients.

Analyzing Outsourcing

Some economists have expressed a concern that outsourcing may be less likely than other forms of international trade to be beneficial to overall prosperity and more likely to harm the workforce. Conventional analysis of trade policy distin-guishes three issues: how does trade affect aggregate economic welfare; what is its effect on the level of employment; and how does it affect income distribution, especially the real wages of workers? The popular textbook models of trade, like the two-country, two-factor, two-country model (Bhagwati, Panagariya and Srinivasan, 1998, chapters 5, 6 and 10) used extensively by international trade theorists and associated with Paul Samuelson's classic stripped-down version of the Heckscher-Ohlin model, typically answer these questions along these lines. First, free trade in this model raises the overall income of each nation over what it will have under autarky; it enlarges the size of the pie available to each country in the process. Second, this model focuses on long-run analysis and therefore assumes full em-ployment, which means it *assumes* that trade has no effect on the aggregate number of jobs. Third, the model allows factor prices to adjust to maintain full employment, and therefore, trade can *cause* changes in income distribution.

In particular, imagine a country that is relatively abundant in skilled labor, like the United States, and that begins to trade with a country that is relatively abundant in unskilled labor, like India. In such a case, trade may increase the real income of skilled labor in the United States and lower that of unskilled labor. The need for the reallocation of resources may also cause workers to experience dislocation—that is, the loss of a job, followed by a period of unemployment, followed perhaps by finding that the available jobs pay less than the ones held earlier. In models with flexible real wages, unskilled workers can experience a decline in their real wages.

Nothing changes in this conventional analysis of trade policy when we consider outsourcing. To illustrate this conclusion, we consider three alternative models that capture different aspects of trade in services according to Mode 1. The first model uses one (aggregate) final good and two factors of production. With only one final good, there is no basis for trade initially. But the introduction of outsourcing opens the possibility of trading labor services for the final good. This outsourcing leads unambiguously to welfare gains, with the usual distributive effects between the two factors. The second model contains two goods and three factors. This model allows for conventional trade in goods at fixed world prices initially and then introduces outsourcing. It shows that the country still gains overall from outsourcing, albeit with the income-distribution effects just as in the first model. The third model has

three goods and two factors, and it shifts the nature of outsourcing to one where, with two traded goods, the third non-traded good becomes tradable online. In this model, allowing the nontraded good to be imported at a lower price, thanks to offshore trading becoming feasible, leads to welfare gain and to both factors becoming better off, thus refuting the presumption that outsourcing will necessarily harm the real wages of particular factors of production. The overall message of these models is that offshore outsourcing is generally beneficial to an economy (with conventional caveats, and also the distributional effects are not necessarily divisive).

Model 1: Gains from Outsourcing in a One-Good Model

Let's start with a model that has only one good, which is produced with two factors of production, labor and capital. Assume diminishing returns to the factors, and let the MP_L curve in Figure 1 represent the marginal product of labor, given the fixed endowment of capital in the economy. Letting L^0 be the endowment of labor, the wage in terms of the final good is represented by W^0. The wage bill is the area formed by the rectangle $OW^0E^0L^0$. The return to capital is the area under the MP_L curve and above the horizontal line W^0E^0.

Given only one good, this model offers no scope for conventional international trade. Suppose, however, that an innovation allows the economy to buy the services of labor abroad electronically at the fixed wage W'. The economy continues to hire the same endowment of domestic labor, but now paying the lower wage. In this case, the economy buys L^0L' labor abroad paying the rectangle $L^0L'E'R$ for it. Domestic labor receives OL^0RW' and capital the area under the MP_L curve and above the horizontal line $W'E'$.

The following economic effects obtain. The country's total income rises by the triangular area E^0RE', which is the net gain from outsourcing. The income of labor, the "import-competing" factor, declines by area W^0E^0RW' and is redistributed to capital. Thus, capital owners make a gain of $W^0E^0E'W'$.

This model captures much of the popular rhetoric that expresses doubts about outsourcing. That is, the model shows that outsourcing may benefit society as a whole. But in the absence of a method for some of the social benefits received by capital to be transferred to workers, firms or owners of capital receive more than 100 percent of the social benefits from outsourcing, while workers experience losses.

Model 2: Gains from Outsourcing in the Presence of Trade

Now consider a two-good, three-factor model in which the country already trades in the world markets and a technological innovation makes outsourcing possible. Following Samuelson (1971) and Jones (1971), let there be two final goods, each produced using a sector-specific factor and another factor that is common to both goods. For concreteness, say that the import-competing good uses unskilled labor as its specific factor, while the exportable good uses capital as its specific factor, with the common factor to producing both goods being skilled

Figure 1
Economics of Outsourcing
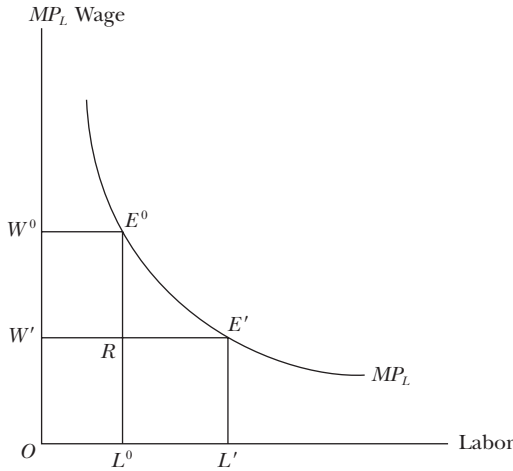
labor. Now imagine that a technological change makes it possible for skilled labor to be outsourced.

Taking the world prices as given for the moment, Figure 2 shows the initial trading equilibrium in the absence of outsourcing. Axis $O_1 O_2$ represents the total endowment of skilled labor in the economy. We measure skilled labor employed in sector 1 of import competing goods to the right from O_1 and that in sector 2 of exportable goods to the left from O_2. Thus, any point on $O_1 O_2$ represents an allocation of skilled labor between the two sectors. The $VMPL_1$ and $VMPL_2$ denote the value-of-marginal-product curves for skilled labor in sectors 1 and 2, respectively. The equilibrium allocation of skilled labor between the two sectors is given by S^0, where the skilled wage offered by the two sectors is the same, R^0. The GDP can be then measured by the sum of the areas under the two curves up to the point indicating the employment of skilled labor, S^0, which will show the total production of both goods.

Suppose now that an innovation allows the country to purchase the services of skilled labor abroad at a lower wage shown by R'. At this wage, there is excess demand for the services of skilled labor equaling GE'. This demand is satisfied through outsourcing, which expands the skilled-labor supply by $O_2 O_2'$ such that $O_2 O_2' = GE'$.

To locate the new equilibrium, we shift the $VMPL_2$ curve horizontally to the right by $O_2 O_2' = GE'$ as shown by $VMPL_2'$ (alternatively, we could shift the $VMPL_1$ curve to the left by the same amount). Because the size of this horizontal shift to the right is the same at every point, $E^0 A = GE'$ by construction, sector 1 employs $S^0 S'$ of the outsourced supply and sector 2 employs $S' S''$. The quantity of outsourced labor is $O_2 O_2'$, and it is paid the wage R'.

The arrival of outsourcing increases national income. To see this on the

Figure 2
Outsourcing with Pre-Existing Trade in Goods
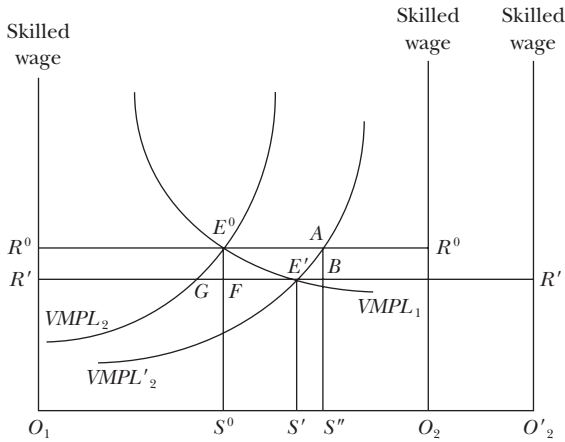
diagram, first consider sector 1 and then sector 2. Before outsourcing, the original total value of output of sector 1 at the original wage R was given by the area under the $VMPL_1$ curve, up to the quantity of skilled labor input O_1S^0. After outsourcing, the value of output is the area under the $VMPL_1$ curve up to the quantity of skilled labor input O_1S'. However, the extra rectangle $S^0FE'S'$ represents wages that need to be paid to the workers who provided the outsourced services, so the output value gain in sector 1 is the triangle E^0FE'. Now consider sector 2, where in graphical terms, the addition of outsourced labor has "pulled" both the right-hand axis and the $VMPL_2$ curve to the right. Because of this horizontal shift, the original value of output of sector 2, which was the area under $VMPL_2$ given the skilled labor input O_2S^0 (measuring from right to left), is exactly equal to the area under $VMPL'_2$ given the input of skilled labor from O'_2 to S''. However, sector 2 can also increase output by making use of outsourced labor from S'' to S'. The rectangle $S'E'BS''$ must be paid to foreign workers in sector 2, but the triangle ABE' represents a social gain. Thus, the increase in output for the home country consists the sum of the two triangles E^0FE' and ABE'.

The distributional issues become more complex in this setting. However, assuming diminishing returns to all factors of production, the increase in quantity used of skilled labor and a decline in the skilled wage will cause the unskilled wage and the rental on capital to rise.

As long as we assume that the country is small so that the terms of trade are fixed and there are no other distortions in the form of prior tariffs or distortionary taxes, outsourcing remains beneficial in this setting. However, if we assume that the country is large, the introduction of outsourcing will not necessarily lead to a welfare gain, because the opening to outsourcing can shift the terms of trade in the final goods. There are two alternative ways to understand this result.

First, imagine that at the initial prices, outsourcing expands the output of the

exportable good more than the demand for it, which raises the possibility that the terms of trade in the goods market deteriorate (that is, it will cost a nation more in terms of exports to purchase a fixed quantity of imports). This deterioration may more than offset the direct benefits from outsourcing. Alternatively, if outsourcing largely expands the output of the import competing good, the demand for imports declines, which lowers the price of the imported good and improves the terms of trade. In this case, the direct gain from outsourcing is reinforced by the improvement in the terms of trade.

A second way to understand how outsourcing can lead to welfare losses draws on the generalized theory of immiserizing growth, developed in Bhagwati (1968). Bhagwati demonstrated that a nation's own growth in the presence of distortions could be immiserizing to the nation itself when it occurred in the presence of an uncorrected distortion. The secondary loss from the distortion can be accentuated by the growth, outweighing the primary gain from the growth. When trade opportunity increases such as that resulting from the information technology that converts the hitherto nontradable service into a Mode 1 service, this is analytically the equivalent of growth. But when a large country is following a free trade policy instead of exploiting its monopoly power in trade by adopting an optimal tariff, the free trade policy itself is a kind of distortion—and the enhanced trade opportunity may accentuate the loss from such a policy (Bhagwati, Panagariya and Srinivasan, 1998, chapter 29).

In thinking about the welfare consequences of Mode 1 services in this model, it is worth stressing that there really are three scenarios: autarky, free trade before outsourcing and free trade after outsourcing. Either of the trade outcomes will be preferable to autarky in welfare terms. However, while free trade with outsourcing will be preferable to free trade without outsourcing in an economy with fixed terms of trade and no other distortions, this conclusion can, but need not, be overturned if those assumptions change.

Model 3: Both Factors Gain

In the previous model, outsourcing leads to an adverse impact on the real income of the factor of production imported online. But this outcome is not inevitable. Consider a three-good, two-factor model such that goods 1 and 2 are traded, while good 3 is initially a nontraded service. Assume, as before, that the country is small and produces both traded goods. Perfect competition ensures that the average cost of each trade good, which is a function of the two-factor prices, equals the exogenously given goods price. The two average-cost-pricing equations then ensure that the factor prices themselves are fixed as long as the traded good prices are fixed. Given these fixed factor prices, the average cost of good 3 is fixed as well, implying that its supply curve is horizontal with its equilibrium quantity determined entirely by demand.[6]

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[6] This is the well-known Komiya (1967) model that has been generalized to a dynamic context by Findlay (1970).

Suppose now that due to an innovation, the formerly nontraded service becomes tradable and is available from abroad at a lower price than the one at which it is supplied at home. It then follows that the domestic supply of the service will disappear altogether, with the resources released by it absorbed by production of goods 1 and 2. As long as both of these goods continue to be produced, the factor prices measured in terms of those goods will be unchanged. But since the price of the service, good 3, has declined, the buying power of the two factors in terms of that good rises. Thus, outsourcing ends up making the owners of both factors better off.

These models underline the fact that trade in outsourced services is just another kind of trade, subject to the same principles that the theorists of commercial policy have developed in the postwar period (and are set out in Bhagwati, 2002). With trade in either goods or services, the precise manner in which the benefits of outsourcing filter through the economy depends on the structure of the economy. Thus, if outsourcing principally takes the form of an intermediate input into the production of other goods, it will act like input-saving technical change, augmenting productivity. An example would be customized software or designs supplied at lower costs through outsourcing to the firms producing, say, automobiles in the United States. On the other hand, if outsourcing takes the form of a new product or an old product supplied at a lower price to the final consumers, it will directly add to real income.

These three models can be thought of as describing several possible outcomes of a technological change that leads to increased outsourcing. In the first model, outsourcing benefits society, but the benefits arrive in a combination of higher returns to capital and lower wages. In the second model, with multiple factors of production and fixed goods prices, outsourcing again provides aggregate benefits, but some workers gain while others lose. In the final model, outsourcing provides benefits in a way that, at least after workers make a transition to other industries, leads to higher real incomes for all workers.

Accumulation of Skills Abroad

So far, we have analyzed outsourcing as involving technical change that entails converting a nontradable service, initially requiring proximity of provider and user, into a Mode 1 traded service. The phenomenon is analytically analogous to a reduction in transport costs that turns some initially nontraded goods into traded goods. It therefore has effects on the United States similar to those of conventional freeing of trade, holding the factor endowments including skill levels constant.

But offshore outsourcing may also be augmented, holding the technology of outsourcing constant, when skills levels increase abroad in countries like India and China. Some of the recent outsourcing fears have arisen from this analytically distinct possibility. For example, Craig Barrett, the chief executive officer of Intel, has argued that India and China will soon have 300 million high-skilled workers and that this situation poses a danger to the U.S. prosperity and to skilled workers in the U.S. economy (Sickinger, 2004; "Q & A: Intel CEO Craig Barrett," 2003).

Fears have been aroused that the acquisition by foreign workers of the information technology related, medical and other skills would lead to losses both for the U.S. economy in the aggregate and for the skilled American workers.

While we will later question the empirical relevance of these fears, we focus here on the analytic issue they raise. Taking the outsourcing technology as given, what is the effect of an increase in the number of skilled workers abroad on U.S. prosperity and on U.S. skilled workers? The three models we have outlined above readily permit the analysis of this question.

The effect of the expansion of skilled labor force abroad feeds directly into the U.S. economy through the wage paid to the workers providing outsourcing services in Models 1 and 2 and indirectly through the price of good 3 in Model 3. In Models 1 and 2, the increased supply of skilled labor in the foreign economy leads to a decline in the skilled wage there. In consequence, in Model 1, the augmented skill levels abroad will increase aggregate U.S. welfare but will also reduce the real wages of the skilled workers in the United States.

In Model 2, the same results should follow, but there is a complication because of trade in goods. If the United States were a "small country" in the sense that it cannot affect the goods terms of trade, the storyline is the same as with Model 1: overall gain, loss for skilled workers. But if the terms of trade can shift, we must take a possible induced (secondary) effect into account. If terms of trade deteriorate for the United States, this secondary loss can outweigh the primary gain from the lower wage of skilled offshore services, resulting in a net loss of U.S. welfare.

In Model 3, where the skill accumulation abroad can only work its trade effects indirectly through the goods markets, the expansion of skills abroad will manifest itself in a decline in the price of good 3, with beneficial effect for the United States. Moreover, under the small-country assumption, since the two factor prices continue to be determined by the average-cost-pricing conditions in the goods market, the real returns will be unchanged in terms of the traded goods but will rise in terms of good 3: both factors will therefore benefit.

Evidently, therefore, the message again is much like that from analysis in conventional trade models. That skills accumulation abroad, or for that matter any exogenous change abroad, will harm or help the United States, depending on what happens to the terms of trade, is a message that is in fact pretty well understood in the analytical literature that goes back over half a century. Thus, when the U.S. economy was growing more briskly than the European economy in the 1950s, and there was a celebrated "dollar shortage," Europeans were concerned that U.S. growth injured their standard of living. When Japan was growing rapidly in the 1960s and 1970s, many Americans, fearful of Japan becoming the premier world economy, were equally concerned that Japanese growth would harm the United States. The same argument is now surfacing again in the context of China and India, spurred by the loss of a few jobs to offshore outsourcing.[7]

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[7] In the 1930s, fear of cheap Japanese exports of textiles, lamps, hurricane lanterns and other labor-intensive products led to talk of the "yellow peril." The most feared product that made it into popular

The answer that all depends on the induced terms of trade change, if any, can be traced back to the literature inspired by the European fears of U.S. productivity growth in the 1950s. In one of several pioneering contributions, Harry Johnson (1954) constructed a two-country, two-good model in which each country specialized entirely in one good. When the U.S. economy grew, the production of its export good increased and, provided the import good was not inferior in U.S. consumption, the effect was to increase U.S. exports of its own good, lower the price of U.S. exports and help Europe. Johnson (1955) then generalized the analysis by allowing the production of both goods by each country: this allowed the consumption effect of growth to be offset by the production effect of the growth, so that (consistent with market stability) the terms of trade could either rise or fall, leaving the effect on European welfare ambiguous.[8]

Whether the change abroad is significant enough, in terms of its net effects on excess demands and supplies of goods at existing terms of trade, and whether it makes sense to worry about sufficiently large "national monopoly power" in international trade such that large terms of trade changes may follow from modest changes in excess demands and supplies, are empirical questions where our presumptions (addressed in part below) are to discount and dismiss the possibility of significant terms of trade changes following skills accumulation abroad.

Implications for Outsourcing and the U.S. Economy: Welfare, Jobs, Wages and Dislocation

Let us now turn to a consideration of the implications of outsourcing for the U.S. economy. There are four issues to consider: overall welfare; the total number of jobs; the quality of jobs; and dislocation.

Overall Welfare

Our theoretical analysis leads us to conclude that there is a strong presumption that outsourcing that turns previously nontraded services into Mode 1 tradable

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consciousness was the "one-dollar blouse." Recent years have seen revived fears of the "yellow peril," involving either exports from Asian "tiger" economies like South Korea, Thailand and Indonesia and also from China. The offshore "outsourcing" of services might be called the "brown peril," since the foreign country most prominently involved in media reports is India.

[8] In a theoretical contribution in this journal, Paul Samuelson (2004) has constructed a Ricardian model where the effect of productivity change abroad is to make the autarkic price ratios between goods identical between the trading countries so that the gains from trade disappear for each of the trading countries. This means, of course, that the country that has not experienced any change is immiserized: the external change has eliminated the gains from trade while the country has no primary gain of its own to set against that loss. It is like being hit by a cyclone that arrives exogenously to one's actions. Panagariya (2004) shows, however, that the Samuelson analysis does not capture the essence of the offshore outsourcing phenomenon. The recent work of Gomory and Baumol (2001, chapter 2) is understood in a similar way: it shows some countries gaining and some losing from changes in productivity coefficients in a Ricardian economy.

services is beneficial to the United States. We have also shown that taking the phenomenon of outsourcing as given, the expansion of skills abroad that we already import is also beneficial for the U.S. economy, since it makes the imported services even cheaper. The main qualification results from the possibility of the deterioration of the terms of trade in other goods—specifically, that the primary beneficial impact of the introduction of outsourcing or expansion of skills abroad may give rise to a sufficiently strong adverse secondary terms of trade effect in the traded goods to offset the former.

This may happen, for example, because the U.S. exports goods that are more intensive in information technology services and imports goods that are less intensive in information technology. Taking outsourcing as given, foreign (say, Indian and Chinese) growth then makes the outsourced information technology services cheaper to the United States, which is beneficial, but it also has the harmful effect that it expands the world supply of the information technology intensive good that the U.S. economy exports and, thus, worsens the U.S. terms of trade.

There are good reasons to believe that this last possibility does not capture the reality of outsourcing, however. For one thing, growth in China and India in the near future is likely to remain concentrated in low-end information technology services that they are already exporting to the United States. The notion that India and China will quickly educate 300 million of their citizens to acquire sophisticated and complex skills at stake borders on the ludicrous. The educational sectors in these countries face enormous difficulties. The students enrolled in colleges and universities in India account for only 6 percent of the population in their age group (18–24 years). Of those that do enroll in college, only a tiny fraction have the minimal English language skills that would enable them to function even moderately well in occupations such as call answering. Moreover, with the exception of a handful of institutions such as the Indian Institutes of Technology and Indian Institutes of Management, the higher education system in India is in a dire state and starved of resources. Adding 300 million to the pool of the skilled workers in India and China will take some decades.

Even if we were to grant the possibility of substantial expansion of complex skills in China and India, the conventional Johnson-type model (1955) that predicts losses due to the deterioration of the terms of trade becomes less relevant. When the revival of Europe and Japan brought their skill levels closer to those of the United States, the gains from trade induced by "factor endowment differences" were increasingly replaced by gains from "intraindustry" trade; for example, the United States now specializes in high-end chips such as Pentium, while leaving more standard semiconductor chips to foreign producers. Similarly, we can confidently expect "intraservice" and "intraindustry" trade to grow between the United States on the one hand and China and India on the other as the latter acquire more skills. Models such as those of Johnson in the 1950s do not give a particularly helpful handle on the analysis that is called for today.

One final source of gains from outsourcing is the gain in productivity that lower-priced services used as intermediate inputs can bring. Mann (2003), drawing on Mann and Kirkegaard (2003), points to very substantial productivity gains for the United States from the globalization of information technology hardware production. She reports that globalized production and trade made information technology hardware 10 to 30 percent cheaper than it would have been otherwise. Taking the mid-point of these estimates, she calculates that the price decrease translated into higher productivity growth and a faster real GDP growth of 0.3 percent per year from 1995 to 2002 in the United States. She hypothesizes that globally integrated production of information technology software and services will follow a similar pattern, reduce the prices of these products and promote further diffusion of information technology throughout the U.S. economy. In turn, this would give further boost to productivity growth.

The Total Number of Jobs

Economists typically argue, with plausibility for the current U.S. economy, that macroeconomic policy determines the total number of jobs, whereas trade policy affects the composition of jobs.[9] Thus, Brainard and Litan (2004) note in their recent analysis of outsourcing that the number of jobs has flexibly adjusted to the growth in the labor force in the United States. Despite declining barriers to trade, rapid expansion of the volume of imports and the innovation of what appear to be job displacing technologies, the U.S. economy has added 30 million workers to its payrolls since 1985—including the 2001 recession and the relatively slow growth in jobs during the recovery. Moreover, the growth in jobs has been attended by a rise in the median family income by 20 percent during the last two decades.

Those who contend that all or most service jobs will be outsourced to India and China are both empirically and theoretically mistaken. The empirical mistake is that not all service jobs can be outsourced. About 70 percent of the jobs in the United States are in service industries such as retailing, catering, restaurants and hotels, tourism and personal care that require the consumer and producer to be present in the same place and, therefore, cannot be outsourced (Agrawal and Farrell, 2003). The theoretical mistake is that the possibility that all jobs, in both manufactures and services, will go to China and India, whether through outsourcing or other trade, because of low labor costs, comes perilously close to confusing absolute and comparative advantage.

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[9] In certain situations, trade policy can affect the total number of jobs. For example, in a Keynesian economy, tariffs can shift a given expenditure toward home goods, yielding an expansionary effect on output and employment. Or in a situation of sticky real wages with associated unemployment, trade policy can affect total employment, as analyzed in pioneering articles by Brecher (1974a, b). But neither possibility applies in a significant manner to the U.S. economy currently. This view seems implicit also in the writings of labor economists like Alan Krueger who say that the number of jobs in the United States is determined by the supply of workers: a view that is inconsistent with Keynesian unemployment or inflexible real wage neoclassical models.

Finally, not all outsourcing results in direct displacement of the U.S. workers. In some cases, it may create services not previously available, which is like opening an economy to the imports of products not produced in the country. For example, getting telephone numbers through 411 and 555-1212 had become very expensive, and as a U.S.-based service, it would have been virtually eliminated. Instead, the availability of call centers abroad has made it possible to retain this service. In other cases, outsourcing may replace capital rather than workers in the United States. Outsourcing allows some human operators abroad to answer the phone for many billing and business inquiries, rather than having such tasks replaced by fully automated electronic response systems. Likewise, outsourcing may lead to a return to manual inputting of checks into the computer system instead of using expensive imaging software.[10]

But even if outsourcing and trade are unlikely to reduce *total* employment, *specific* types of jobs can certainly be lost, like jobs in telephone call centers or in routine tax preparation. The interesting question is whether the new jobs that workers displaced by outsourcing will find are going to be "better" jobs that pay more or "worse" jobs that pay less. Are computer programmers earning $60,000 going to be bumped down into $15,000 jobs stocking shelves and bagging groceries at Wal-Mart?

Will Other High-Value Jobs Arise?

There are several reasons to expect that other high-value jobs will arise for any workers displaced by outsourcing, so that outsourcing is unlikely to lower overall wage level of the displaced U.S. workers.

First, outsourcing from the U.S. economy is generally for low-value jobs, like back-office operations, phone centers and data entry. There are admittedly some exceptions—R&D laboratories have been set up in India, for instance—but this process seems unlikely to go very far in intermediate run, since the labs often have to be close to home where new products tend to be developed. This effect of outsourcing is like the first stage of what Raymond Vernon (1966) famously called the "product cycle," where innovating firms introduce and debug the product in the domestic market, and once the product matures and is standardized, they shift its production to countries where it is cheapest to produce, with the home country eventually becoming an importer of the product. On the other hand, insourcing to the United States—where others buy American-produced legal, medical, educational and other services online—leads to higher-value jobs. Thus, outsourcing means that the U.S. economy loses low-wage call centers, but gains high-wage jobs in medical, legal and other services. On balance, therefore, the outsourcing phenomenon, or the expansion of trade in Mode 1 services, seems likely to offer America a transition to higher-value jobs.

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[10] The example here has been drawn from Agrawal, Farrell and Reemes (2003), who cite several others.

The claim that outsourcing will lead to a reduction in information technology jobs in the U.S. economy seems especially far-fetched. The *Occupation Outlook Handbook* (*OOH*) of the Bureau of Labor statistics, as discussed in Mann (2003), projects that three of the ten largest numerical increases in job categories will be computer-related occupations: computer support specialists, computer software applications engineers and computer software systems engineers. The *OOH* also predicts that 13 percent of the total number of jobs created in the economy up till 2010 will be related to information technology. The growth in these occupations will be 43 percent, compared with an economy-wide job growth rate of 13 percent. Although the precise growth rates in the *OOH* predictions should not be taken too seriously, the general direction of the trends seems clear.

The general point is that the dynamic U.S. economy grows by a continuous infusion of new products and processes, which in turn offers a stream of new jobs. Even if some computer support technicians start answering phone questions from overseas, an increased number of service firms will provide technicians to set up, repair and manage computer and infrastructure services here in the United States. These "electronic plumbers" of the future, like the water-oriented plumbers of old, will earn more money than many professors. Similarly, even if some jobs for medical technicians, like reading x-ray charts, migrate overseas, surely no one expects that the U.S. health care industry as a whole will diminish its number of jobs with an aging population and an obesity epidemic. As long as the U.S. economy continues to raise its levels of technology, human capital and physical capital and to run an economy not too far from full employment, then the dynamic twists and turns of that economy will produce higher-wage jobs.

Job Dislocation

Popular economic models of trade, at least the basic ones used in this paper, typically assume that workers who lose one job can readily find another (although the wage may change, and not necessarily for the worse). But in the real world, workers may suffer through a period of joblessness and displacement.

One of the most influential studies of the costs of trade displacement, by Lori Kletzer (2001), divides manufacturing industries into low, medium and high im-port competing, based on the change in the import share during 1979–1994. For example, the import-competing group includes the usual labor-intensive industries such as apparel, footwear, knitting mills, leather products, textiles, blast furnaces, radio and television and toys and sporting goods and accounts for 6.5 million, or 38 percent, of the total jobs displaced in manufacturing during 1979–1999. Across all three groups of industries, about two-thirds of those displaced are reemployed within two years, with about half of that group ending up with job that paid roughly as much or more than their previous job and the other half experiencing a wage cut of 15 percent or more. Thus, the rate of reemployment and wage changes for workers that Kletzer characterizes as trade displaced are quite similar to those for

other workers. In other words, a common factor, most likely technological change, is behind the displacement in all categories.[11]

The issue of how society should deal with displaced workers will arise in any dynamic market-oriented economy. For example, the United States has unemployment assistance that applies regardless of whether a worker loses a job because of poor management, poor personal performance, a shift in demand, a shift in the technology of production, a shift in many of the domestic policies, domestic competition, foreign competition or outsourcing. The United States has also had specific assistance programs for the manufacturing-sector employees displaced by imports competition for over four decades (Baicker and Rehavi, 2004) and international economists have vigorously analyzed adjustment assistance as far back as the 1980s (Bhagwati, 1982). Trade adjustment assistance of this type seems a prudent public policy if openness to international trade is to be maintained. Such trade adjustment assistance should be extended to workers who are displaced by outsourcing. More broadly, wage insurance schemes for all dislocated workers, such as the one proposed by Kletzer and Litan (2001) and experimentally built into the Trade Promotion Authority legislation of 2003, are also an important innovative idea.

Concluding Remarks

A productive public debate about outsourcing might usefully begin by restricting the "outsourcing" phraseology to services traded internationally at arm's length and principally on-line: what the WTO calls Mode 1 services. Next, it would help to admit that outsourcing is a relatively small phenomenon in the U.S. labor market. Finally, it would be useful to discuss outsourcing as a trade phenomenon, with effects that are not qualitatively different from those of conventional trade in goods. Thus, outsourcing leads to gains from trade and increases in national income, with the caveats that are standard in this literature. For example, at a theoretical level one must recognize, as trade theorists have long done, the complexity introduced by induced deterioration in the terms in trade if the country has monopoly power in trade. At a policy level, one needs to be concerned about workers who are displaced from certain sectors. But outsourcing is not a small step that will take a preponderance of U.S. workers off the edge of an abyss into prolonged unemployment and re-employment only at low wages. Over time, high-value jobs can be expected to arise and expand.

We hope that our analysis will dispel some of the fear of outsourcing. But fear,

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[11] One can raise methodological questions about this study, like how the industries are categorized. Also, the study focuses on manufacturing rather than services or outsourcing, and job-specific or industry-specific skills are likely more important in manufacturing firms while service-oriented skills like accounting or payroll may transfer across firms and industries more easily. But these kinds of concerns seem unlikely to overturn the main result.

as the Russian proverb says, has big eyes. It also can have deaf ears. However, we remain optimistic.

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