
Is There a Good Measure of Competitiveness?

The trade deficit may have its limitations as a statistic, but it is our best measure of America's international competitiveness. . . . Our deficit can be financed only by more debt or the selling of assets. This is a strange definition of economic health.

—Jeff Faux, President of the Economic Policy Institute, letter to the editor,
New York Times (26 November 1997)

The United States is far and away the most competitive large country.

—Executive Summary, World Economic Forum,
Global Competitiveness Report (1998)

[T]he United States will not keep its competitive edge as a nation unless long-term vulnerabilities in saving, investment, research, and education are overcome.

—John Yochelson, "Can the U.S. Compete? A Ten-Year Outlook,"
Chief Executive (June 1997)

By many measures, the United States is the world leader. Most technological innovations originate in US universities and businesses. Many US exporters are the world's most cost-efficient producers. US financial institutions make financial capital work more efficiently to meet business needs around the globe. The United States tops the World Economic Forum's measure of international competitiveness (the "Davos index").

Yet the external deficit continues to widen. Why does the competitiveness of universities, exporters, financial institutions, and other elements of the US economy not translate into a positive trade balance? Is external balance a good measure of the competitiveness of a nation? Are there better measures?

There are several approaches to measuring national competitiveness. One is to link price competitiveness, a microeconomic concept, with external balance, a macroeconomic concept. The prices of exports and imports that drive trade flows and thus external balance are determined in part by the costs and strategies of individual businesses, for which microeconomic concepts of price competitiveness are crucial. But macroeconomic factors such as exchange rates, which an individual firm does not control, also affect a firm's price competitiveness. Together firms' microeconomic decisions and broader macroeconomic factors affect the price competitiveness of exporters and import-competing firms, and price competitiveness is one force driving trade flows and external balance.

Price competitiveness is not the only determinant of external balance, however. The external deficit represents the collective actions of individual consumers, businesses, and government. The balance is determined by the difference between aggregate domestic production and aggregate domestic spending. When a country spends more than it produces, it will have a deficit even if in price terms its workers and producers are world-class competitors.

Moreover, prices measure competitiveness only at a given point in time. Long-term competitiveness is founded on the quality of resources firms use to produce goods and services as well as on the decisions made by households, businesses, and government to spend and save. The efficiency with which the financial markets transform savings into investment, the pace and uptake of technological innovations, the ability of workers to adjust to changing skills demanded in the workplace, and the quality of the political and policymaking processes all affect a country's long-term ability to produce and compete in the international marketplace.

Finally, purchasing power is another indicator of competitiveness. The "terms of trade" for the United States—the price of exports compared to US imports—measures the purchasing power of US exports. The more highly valued products should command relatively higher prices. So do rises in terms of trade signal improved competitiveness?

As we shall see, these different measures of competitiveness can move in opposite directions, with some suggesting an improvement in competitiveness while others suggest a deterioration. The bottom line, however, is that superior relative price competitiveness plays out in terms of higher global market share, and relative prices and market shares are better measures of competitiveness than is the trade deficit.

Determinants of Relative Prices and Implications for Competitiveness

External balance is a macroeconomic concept that rests uncomfortably on the microeconomic foundation of relative prices. As discussed in chapter

2, external balance can be described in two equivalent ways: as the difference between production and consumption by all members of the economy, or as the difference between exports and imports. What are the economic incentives that drive the firm to choose what to produce in the national economy and how much to sell abroad? How do consumers decide what to buy, and whether to buy domestic or imported goods?

The key factor in such decisions is the relative price of similar products that compete with each other and that can be purchased at home or abroad. For example, a US firm selling a product in the United States competes with other domestic producers' products as well as with imported products. A US exporter's goods and services compete with similar products sold by domestic firms in the destination market as well as with those produced by other firms in third countries. Hence what matters for production and demand decisions is the *relative price* of the good or service. But what the firm controls, at least in part, is its own *absolute price*.

What determines the absolute price, and then the more important relative price, of a good or service? Very simply, a product's price is determined by costs of production and the margin or markup that the firm adds for profit. In the case of internationally traded products, the exchange rate, which translates the price quoted by the firm into the buyer's currency, is also a critical component of the relative price. Using this simple pricing structure, we can point out some key sources of international price competitiveness that will affect the external balance. The relative price of US products to competing foreign products is just the ratio of the US price to the foreign price; its components are the relative costs, the relative markups, and the exchange rate of the foreign currency to US dollars.

These ratios illustrate that what firms control most directly as part of a business strategy (the markup or profit margin) is only one element of the relative price and thus of how much a firm will sell. The firm does not control many aspects of costs, nor does the firm control the exchange rate. In short, many factors outside the firm's control will affect relative prices, sales, production, and demand. They will also affect the relative shares of demand satisfied by domestic products and by imports, which in turn directly affects the external balance.

Table 7.1 illustrates a hypothetical example that focuses only on how the exchange rate can affect the relative price. A US product is sold for 2,750 yen in Japan (line 1). This absolute price is determined by a cost of production in the United States of \$25, a profit margin of 10 percent (1.10), and an exchange rate of 100 yen to the dollar. This US product competes with a Japanese product priced at 3,300 yen (line 2), which is composed of a cost of production in Japan of 3,000 yen and a profit margin of 10 percent (1.10). At the exchange rate of 100 yen per dollar, the US product is competitively priced in Japan; that is, its price in Japan is much lower than its domestically produced substitute. In fact, the relative price of the US product is 20 percent lower than the Japanese product. In a product class

Table 7.1 Price, profit margins, and exchange rates

$$[P_{US}/P_F] = [V_{US}/V_F] * [C_{US}/C_F] * [E_{FX\$/}]$$

- P = Price
- V = Profit margin
- C = Costs
- E = Exchange rate (foreign/\$)
- US = United States
- F = Foreign country
- FX = Foreign currency

	Price	Cost of production	Margin	Exchange rate	Line
Initial exchange rate = 100 yen/\$					
US product	2,750 yen	25 \$	1.10	100 yen/\$	1
Japanese product	3,300 yen	3,000 yen	1.10	1 yen/yen	2
New exchange rate = 125 yen/\$					
US product	3,438 yen	25 \$	1.10	125 yen/\$	3
Japanese product	3,300 yen	3,000 yen	1.10	1 yen/yen	4
If					
US firm meets the Japanese price	3,300 yen	25 \$	1.056	125 yen/\$	5
US firm maintains relative price advantage	2,750 yen	25 \$	0.88	125 yen/\$	6

characterized by intra-industry trade (as discussed in chapter 3), the US producer probably will not take over the whole market despite this relative price advantage, but it is likely to export its product to Japan.¹

What if the yen depreciates to 125 yen per dollar? At this exchange rate, with all other elements of the model unchanged, the yen price of the US product is 3,438 yen (line 3). The US producer's cost structure in the United States has not changed, but the US product is now priced uncompetitively in the Japanese market, in absolute as well as in relative terms.

The US producer can match the Japanese price by reducing its profit margin from 10 percent to 5.6 percent (line 5). But if it wants to maintain its previous *relative* price advantage of 20 percent (2,750 yen versus 3,300 yen), and thus retain the market share it had prior to the exchange rate change, it would have to reduce its profit margin to 0.88—that is, take a loss of 12 percent on each sale (line 6). In the face of this exchange rate change, if the US firm does not change its pricing behavior, it will lose market share and will export less. With a change in its margins, it could still make some sales, although fewer, which implies fewer exports, and at a loss to profit per unit sold. The lower profitability could have implications for stock-market valuation, investment, future growth, and so on. Moreover, the exchange rate can move beyond the point at which profit margins can absorb the currency fluctuations; clearly, the thinner the margins initially, the less room there is to cut them any thinner in the face of exchange rate fluctuations. The firm must decide whether to abandon the market (reducing exports to zero), or to stay in and, along with working hard to reduce costs and convincing stockholders that it makes sense to absorb currency fluctuations into profits, hope that the yen will appreciate back to its previous level.²

The Key Role of Labor Costs and Quality

Labor costs account for a large share of the costs of production and thus of the absolute price of a product.³ Understanding how labor costs change over time is crucial for explaining relative price competitiveness. There are two main dimensions to labor costs—direct costs and quality. Direct costs

1. Moreover, at this exchange rate, the United States is the lower-cost producer (yen costs are 3,000 yen and the US producer's cost in yen terms is 2,500 yen), so there are global efficiencies in resource utilization generated by US production and exports.

2. Hedging the revenue streams in yen using forward exchange rate contracts would complicate the model without fundamentally changing the result.

3. When imported intermediate goods are used as inputs in the production process, exchange rates play an enhanced role. Evidence suggests that imported intermediates are playing an increasingly important role in the production process.

of labor, such as wage and nonwage compensation, can change over relatively short periods. Quality of labor—that is, productivity, skills, creativity, and flexibility—changes more slowly, and over longer time spans. In evaluating US competitiveness, we might wish to know how US labor compares to labor in other countries in terms of the relatively simple dimension of direct costs as well as the more complex dimension of productivity-adjusted cost.

The first way to gauge what is happening to labor costs is to compare how they have changed in the United States with how they have changed in other countries—each in its own national currency. As figure 7.1a shows, US labor compensation nearly doubled between 1980 and 1997 (the index number rose from 100 to almost 200). Over the same period, German labor costs initially rose somewhat less slowly than US labor costs and then around 1990 started to rise a bit more quickly than US labor costs. Japan shows a similar pattern, although labor compensation has been rising at nearly the same rate as in the United States over the years. In comparison, labor compensation in South Korea has been rising at a much higher rate than US compensation over the whole period (note the different scale on the right axis of figure 7.1a), with the rate of increase accelerating from 1987 to 1996.⁴

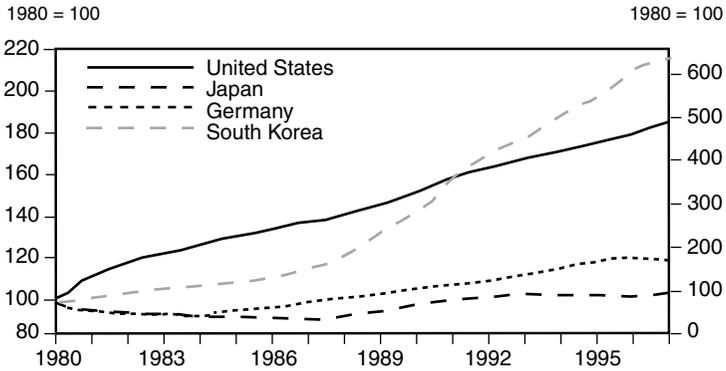
Growth in labor compensation in national currencies provides only a partial picture of how labor costs might affect international price competitiveness. A first adjustment must account for differences between the United States and other countries in growth in labor productivity. That is, compensation may be rising faster in another country than in the United States, but if the workers' productivity is rising even faster, then the real cost of labor in terms of what the producer is using it to "create" is falling.

On this productivity-adjusted basis (but still in national currencies), figure 7.1b shows that US unit labor costs trended upward between 1980 and 1992, with periods of faster and slower growth coinciding generally with inflation, output, and productivity conditions. Since 1992, however, US unit labor costs have fallen, because the inflation rate generally has decreased (reducing upward momentum in wage costs) and growth in both output and productivity have been quite robust. German unit labor costs in deutsche marks have risen much faster than those of the United States in dollars, and have evidenced a very different cyclical pattern. Between 1980 and 1997, German unit labor costs rose about 20 percent more than

4. These figures compare changes in labor costs over time and cannot be used to compare labor cost *levels*. For some business decisions, such as where to site a new labor-intensive plant, the level of labor costs, productivity-adjusted and in a common currency, is relevant. However, it is quite difficult to compare labor cost levels across countries. Hooper and Vrankovich (1997) present a detailed and data-intensive methodology to compare the level of productivity-adjusted labor costs in a common currency for the G-3. However, to analyze how competitiveness in the international context is changing over time, changes in labor costs (as discussed and presented in the text and figures) are more relevant.

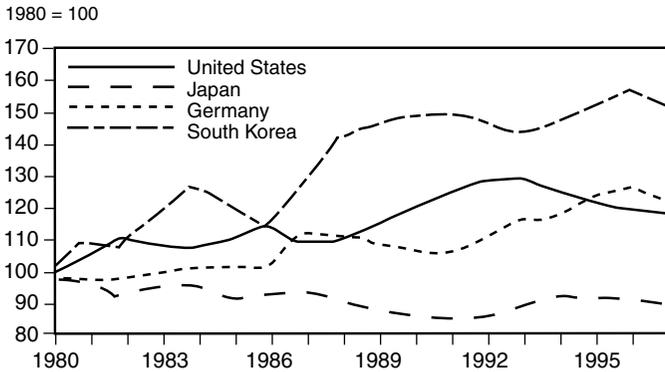
Figure 11. Comparative labor costs

A. Labor compensation in national currency relative to US dollar, 1980-97



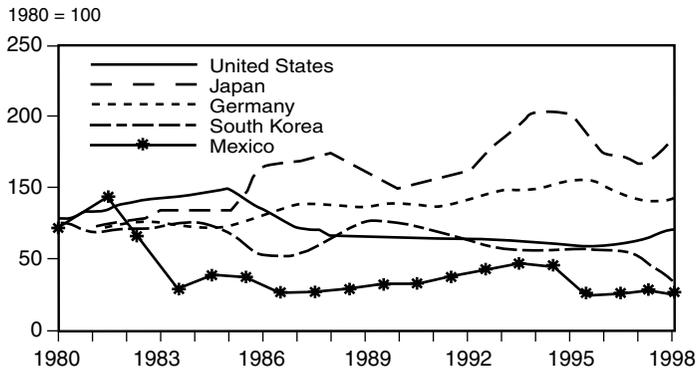
Source: Bureau of Labor Statistics, *International Labor Statistics* <[ftp://ftp.bls.gov/pub/special.requests/ForeignLabor/supptab.txt](http://ftp.bls.gov/pub/special.requests/ForeignLabor/supptab.txt)>.

B. Unit labor cost in national currency relative to the United States, 1980-97



Source: Bureau of Labor Statistics, *International Labor Statistics* <<http://stats.bls.gov/news/release/prod4.t09.htm>>.

C. Unit labor cost in PPP base relative to the United States, 1980-98



Source: Organization for Economic Cooperation and Development, *OECD Economic Outlook*.
 Note: The ratios shown for the other countries are calculated as the country index relative to the US index. Thus, for example, in the first figure an index value of 100 for another country means that that country's compensation in its national currency units is rising at the same rate as US compensation in dollars.

did US unit labor costs (the relative unit labor cost index for Germany stands at about 120 in 1997). By contrast, unit labor costs in Japan have risen more slowly than in the United States (the relative unit labor cost index value for Japan is below 100 throughout the period). Finally, South Korean unit labor costs have risen much more rapidly than in the United States; about one-half of the gap between the levels of US and South Korean unit labor costs was eroded in less than 20 years.

These unit labor cost ratios measure costs in national currencies. Calculating relative price competitiveness in global markets requires a common currency benchmark. We could simply use market exchange rates to calculate compensation on the basis of a common currency (say, the dollar), but market exchange rates can fluctuate for reasons that have nothing to do with external balance or productivity growth. Moreover, firms are not likely to use this measure when comparing labor costs across countries, because they are selling to destinations other than the United States. Using exchange rates measured on the basis of purchasing power parities (PPPs) yields a more realistic international comparison of unit labor costs instead of simply a comparison in dollar terms. As shown in figure 7.1c, this international benchmark reveals a picture very different from the other two, in which exchange rates are not involved.

On a PPP-adjusted basis, unit labor cost in the United States rose during the phase of dollar appreciation through 1985, but then started a downward trend that only recently appears to have reversed. On a PPP-adjusted basis, US unit labor costs have returned to about the level they were in 1980 instead of being about 20 percent higher (compare the index value for the United States in figures 7.1b and 7.1c in 1997). The behavior for comparator countries is quite different when compared in national currency and on a PPP basis.

Japanese PPP-adjusted unit labor costs have risen some 70 percent relative to US costs, although the relative rate of growth has been quite volatile. This contrasts with the relative decline in yen terms. German PPP-adjusted unit labor costs have risen some 20 percent more than US costs, about what occurred in deutsche mark terms. South Korean and Mexican PPP-adjusted unit labor costs, in contrast, have fallen relative to those in the United States; the gap between the levels of unit labor costs quoted in a common currency has widened by some 50 percent since 1980; in national currency terms, just the opposite was taking place, at least in South Korea.

In summary, in order to gauge how the “competitiveness” of US labor is changing, we need to know not just the compensation figures, but also how productive labor is. When judging labor costs in the international arena, an adjustment for currency fluctuations is necessary. It is clear from the comparisons of unit labor costs on a national versus an international basis that the exchange rate adjustment can sometimes outweigh other adjustments in determining relative labor cost competitiveness. Since labor

Table 7.2 Average annual growth of exports and imports (percentage)

	1973-79	1980-85	1986-90	1991-96	1997-98
Real exports	5.2	-1.9	12.8	8.9	2.5
Real imports	4.0	15.0	3.5	11.2	11.9

Source: IMF, *International Financial Statistics*.

is a key component of business costs, it is clear that macroeconomic policies that determine exchange rates can and do have a material impact on relative price competitiveness.

Linking Relative Price Competitiveness to the Trade Balance

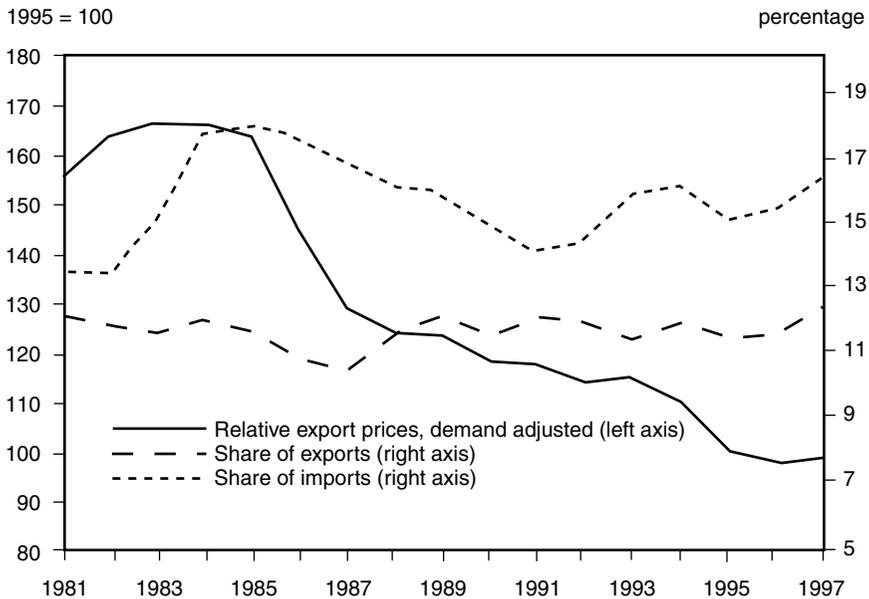
One of the epigraphs at the beginning of this chapter indicates that some people measure the international competitiveness of the United States by the trade balance. In the previous section we saw how competitiveness can be measured by relative prices, which constitute one determinant of the trade balance. How are these two measures—trade balance and relative prices—linked? Do they tell the same story about international competitiveness? Two key factors that link relative prices and the trade balance are movements in the exchange value of the dollar and movements in income growth.

When the exchange value of the dollar moves dramatically, changes in the relative prices of exports and imports can be the prime mover of the flows of imports and exports that determine the US external balance. This was illustrated most clearly in the 1980s, when the dollar appreciated some 50 percent between 1981 and early 1985 and then depreciated nearly the same amount in 1989. As the dollar appreciated during the first half of the 1980s, the relative prices of exports rose and real exports fell at an average annual rate of 1.9 percent (table 7.2). During that period, the relative prices of imports fell and imports grew at an average annual rate of 15 percent. The external balance worsened substantially.

Conversely, as the dollar depreciated during the latter half of the 1980s, export flows boomed, with average annual growth into the double digits at 12.8 percent, and import growth slowed to 3.5 percent. It was a puzzle at the time as to why demand for imports did not slow even more. On examination, it appears that foreign producers chose to contract profit margins to absorb the appreciation of their currencies, just as in the case of the hypothetical example above.⁵ The period of the appreciating dollar was

5. Growth in incomes at home and abroad also had a key role in determining the dynamics of the US external balance. This example highlights the effects of changes in exchange rates and profit margins. For more on the puzzling behavior of the US external balances during this period, see Mann (1986), Hooper and Mann (1987), Cline (1989), and Krugman (1991).

Figure 7.2 US relative export prices and global market share, 1981-97



Source: Organization for Economic Cooperation and Development, *OECD Economic Outlook* (December 1997).

associated with improved terms of trade (rising export prices relative to import prices) but a deterioration in the trade balance, with exports falling and imports rising.

A second way to use trade flows instead of relative prices to measure international competitiveness is to examine the share of US exports and imports in global exports and imports. The share of global trade implicitly incorporates both price competitiveness and differentials in GDP growth.⁶ For example, suppose relative prices remain unchanged, but a country has strong domestic demand during a period when the rest of the world is in recession. That country would tend to absorb a greater share of world imports than if the rest of the world also was growing strongly. Conversely, if all parts of the world were growing at about the same rate, but the relative price of US exports compared to their competitors' prices was falling, US exports would tend to capture a greater share of the global market.

These measures of competitiveness—demand-adjusted relative prices and global market shares—yield a mixed picture for the United States (figure 7.2). On the one hand, the demand-adjusted relative price of US exports has been falling since 1985. This is rather remarkable given the

6. For a discussion of the construction method, see Durand, Madaschi, and Terribile (1998).

development of new suppliers worldwide, the appreciation of the dollar from 1996 on, and the slow growth in the major markets of Mexico and Japan. In the face of global competition for markets, US exporters have become highly productive and acutely price conscious. The decline in relative export prices has kept US exporters' global market share from eroding. On the other hand, the US market is now absorbing a greater share of imports from around the globe than at any other time since the mid-1980s. Moreover, the US share of the world's imports is much higher than the US share in the world's export market, which is consistent with the large US external deficit. So is the United States "uncompetitive" because it has a trade deficit, or is it "supercompetitive" because its global market share of exports is higher than it has been at any time in the past 20 years?

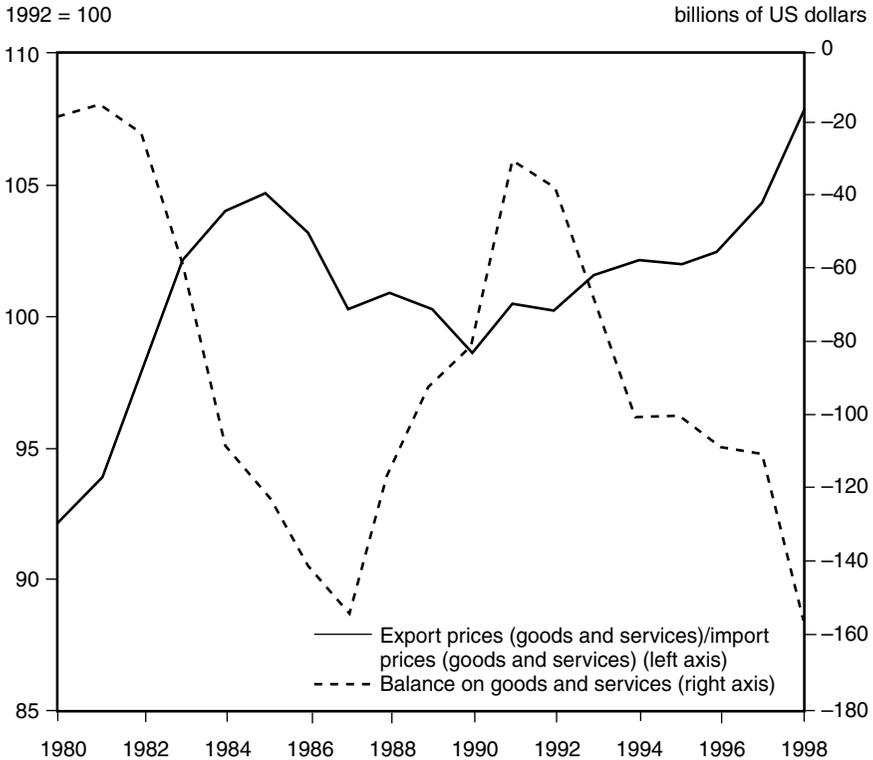
What the data show us is that, on the basis of relative prices, the United States is globally competitive, but other factors besides relative prices drive the external balance—specifically, income growth rates. When the US grows faster than its trading partners and consumes more than it produces, these macro factors can outweigh internationally competitive relative prices and business strategies, and a trade deficit results. Consequently, a country's competitiveness is better measured by relative price competitiveness, particularly the labor cost component. Changes in global market share will reflect this type of competitiveness, but the trade balance may not.

Terms of Trade, Purchasing Power, and Competitiveness

Improved competitiveness should raise a nation's standard of living. The terms of trade measure the price of exports compared to imports. If the price of the products a country sells on international markets rises relative to the price of the products it buys on international markets, then the terms of trade move to favor the exporting country. If the rest of the world is willing to pay a high price for what the United States produces, then does this not mean that the US products are highly desired on world markets? It certainly means that US exports can purchase more imports, and this implies that US resources and income can support a higher standard of living. That is, the United States need give up fewer resources (as embodied in exports) to exchange for the imports that are used to satisfy domestic demand.

An improvement in the terms of trade thus is associated with a higher standard of living. However, higher export prices will reduce foreign sales, and lower import prices will raise imports. Thus an improvement in the terms of trade can be associated with a rising trade deficit (figure 7.3). As the trade deficit becomes unsustainable (see chapter 10), the terms of trade become a poor measure of competitiveness, since rises in terms of trade sow the seeds of the depreciation of the exchange value of the dol-

Figure 7.3 Terms of trade and balance of trade, 1980-98



Sources: US Department of Commerce, *National Income and Product Accounts*; *International Transactions Tables*.

lar (which translates into a deterioration in the terms of trade) necessary to close the trade deficit. Consequently the terms of trade is not a good measure of competitiveness.

Competitiveness through Globalization: The Ownership-Based Supplement

An entirely different method of measuring US international competitiveness focuses on multinational businesses and their links through trade and direct investment. More than one-third of sales of goods and services by US firms in foreign markets and by foreign firms in the US market occur through multinationals. Nearly 40 percent of US exports and about 30 percent of imports are between parent corporations and affiliates. By balance of payments conventions, the sales of goods and services by affil-

iates in a country to customers there are not recorded in the trade statistics, since these transactions occur within a country, not across a border (see US Department of Commerce, *Survey of Current Business*, October 1997). (The profits earned on these transactions do enter the current account as a component of investment income.)

Should affiliate sales be linked to the external accounts? If they were, what might be the consequences for recorded trade flows, the external balance, and concepts of competitiveness? There are three models for how affiliate sales might affect cross-border trade:⁷ Affiliate sales can substitute for cross-border exports, the two can be complementary, or affiliate sales may be impossible without a physical presence in the destination market.

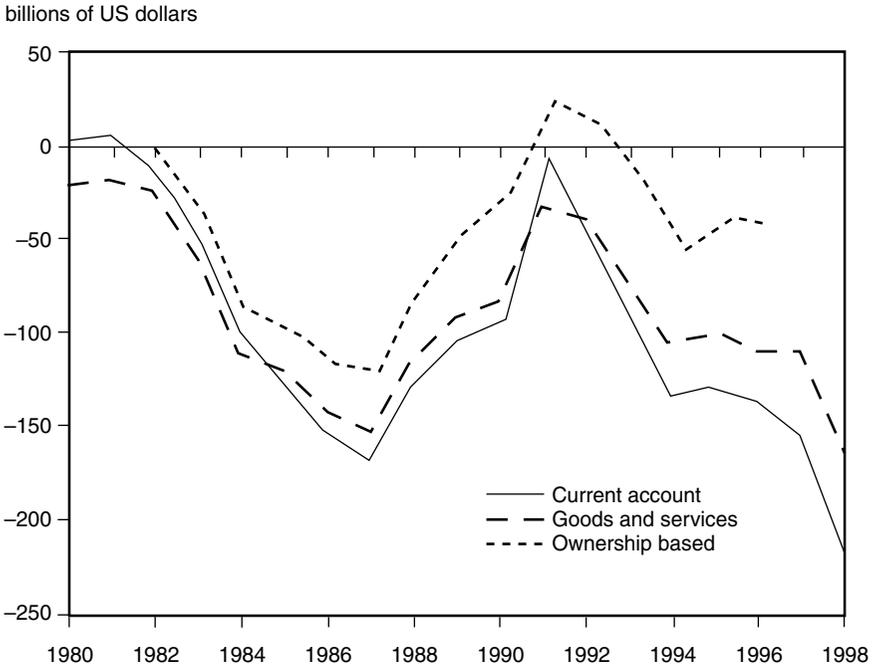
Researchers have investigated the impact of corporate relationships on recorded trade to determine whether the substitution model or the complements model appears to better explain the relationship between trade and affiliate sales. They found that, in general, cross-border trade and direct investment are positively related, and hence they reject the model in which trade and affiliate sales are substitutes (Lipsev 1991; Graham and Krugman 1991).

Because trade flows and affiliate sales are tightly linked, some argue that a better measure of external relations and of external balance would be to add sales by affiliates to cross-border sales. The “total sales” approach was proposed by DeAnne Julius and subsequently refined by the National Academy of Sciences as well as the OECD. In some respects these methods present, in an aggregate way that is consistent with macroeconomic accounting, how corporations account for their own international relationships.

The US Department of Commerce’s Bureau of Economic Analysis (BEA) evaluated various approaches to accounting for international relationships and developed a supplemental account to the standard balance of payments (see US Department of Commerce, *Survey of Current Business*, October 1995). This supplemental account retains the distinction between cross-border trade and trade that occurs between suppliers, affiliates, and customers within the destination market. It is therefore consistent with historical balance-of-payments data, with other countries’ balance-of-payments data, and with national income and product accounts conventions. The BEA supplement presents the gross value of sales by affiliates and also disaggregates those data into inputs from the parents’ own market, inputs from foreign markets, and intracompany sales in the parents’ own market. To arrive at the so-called ownership-based concept of the balance of trade, the BEA sums the value of trade in goods and services with net receipts resulting from sales by affiliates.

7. Parallel analysis holds for both imports and exports. Most of the example here focuses on exports, because evidence from US data suggests that the export relationships are more important than the import relationships.

Figure 7.4 US external balances: Standard and ownership based, 1980-98



Sources: US Department of Commerce, *International Transactions Tables*, Historical Data; *Survey of Current Business* (October 1995); *An Ownership-Based Disaggregation of the US Current Account, 1982-93*.

Figure 7.4 compares three measures of external balance: the current account, the goods and services trade balance, and the ownership-based concept. The general behavior over time of the ownership-based measure of the trade balance looks quite similar to the cross-border measures of the trade balance, although it appears that the new concept adds an increasingly positive wedge to the standard measures. This wedge reflects the positive balance in direct investment abroad and, apparently, the ability of US firms to effectively and efficiently combine US management and other assets with foreign inputs to create much greater value in markets abroad than the reverse combination of foreign management and US resources create in the United States.⁸ This wedge was large enough in 1991 and 1992 to make the ownership-based measure of external balance positive, whereas the standard measures were negative. Moreover, the

8. This assessment of the comparative advantage of US management skills was first proposed in Kravis and Lipsey (1988).

wedge seems to be widening, particularly in recent years, pointing to an increasingly important competitive edge enjoyed by US firms in their relationships abroad.

The contribution to the US economy by net sales of affiliates abroad is large—\$67 billion in 1996. Although these net receipts do not represent a cross-border flow of goods or capital, they do indicate the importance of international integration of production and distribution for US corporate fitness and dynamism (see chapter 3), and they may be part of the reason why productivity growth has increased (see chapter 5). Because of the benefits that come from such global integration, US policy should facilitate and promote further international integration.

The Underpinnings of Long-Term Competitiveness

A price is a summary statistic of contemporaneous inputs, macroeconomic factors, and business decisions. Prices may incorporate information on current competitiveness, but they measure only incompletely the underpinnings of competitiveness in the long term. Similarly, the external balance, however measured, summarizes the macroeconomic state of a country. The preparedness of labor for future jobs, innovation and the development of new technologies, and efficiency and management of financial resources are all important for long-term competitiveness, and these do not show up in the external balance measured at a point in time. Even if the United States is internationally competitive by many measures now, is it preparing adequately for competitiveness in the future?

Is US Labor Prepared for the Future?

Labor's preparation for the future includes, among other things, general education, skill training, flexibility, and creativity to respond to changes in the employment situation. There is no science that describes what is a "good worker." By some indicators, the United States is preparing itself well. The entry rate and completion rate for university education and the percentage of GDP devoted to education are among the highest in the OECD membership. The total student-teacher contact time in public lower secondary education exceeds the OECD average (but still is not much higher than that of several emerging-market nations). The United States has the highest percentage of computer use on a daily basis by high-school students (OECD 1998c, 15, 17, 30, and 306).

By other measures, however, US students currently in school do not fare well on the international scale, and some current workers are not prepared for the changing demands of the workplace. The percentage of stu-

dents graduating from secondary school is lower than the OECD average, ranking with some countries in the emerging markets. Despite having completed secondary education, more than half of US adults (as of 1994-95) performed below the level consistent with “coping with the literacy requirements of everyday life (level 3 of the International Adult Literacy Survey).” In other OECD countries, the proportion of the population attaining secondary education was lower, but literacy rates were higher. The performance of US eighth-grade students on a standardized math test was well below the OECD average, although the performance of fourth graders met the OECD average (OECD 1998c, 22, 24, 27, 32, and 51). The United States ranked 36th among the 53 countries surveyed by the World Economic Forum for effectiveness of math and science education.⁹

Of even greater concern is the gap in educational attainment within the United States. Among OECD member countries, the United States has the greatest difference in mean score on a standardized literacy test between those with tertiary educational attainment and those with less than secondary educational attainment. The United States has the widest gap in student performance between the fourth and eighth grades in math achievement. Once out in the workforce, additional training on the job or after hours in the United States is undertaken more by those who need it less, that is, workers who are already at the upper end of the spectrum of educational attainment. Because of the gap in educational attainment, many workers are not contributing as much as they could to the short-term growth and the long-term potential of the United States. More important for these individuals, the gap is reflected in a widening disparity of income and opportunity.

Technology as the Foundation for Long-Run Competitiveness

With respect to innovation and the foundation for new technologies, the United States presents a mixed picture. By some standard measures, such as patent filings per employee, the United States ranks 21st among the 52 countries surveyed on this measure by the World Economic Forum; by an alternative measure of patents from the OECD, the United States has been surpassed by Switzerland, Australia, Sweden, Germany, and Finland. In terms of R&D as a share of GDP, the United States is outranked by Sweden, Japan, and Switzerland. However, in terms of the number of research-

9. The World Economic Forum is a nongovernmental organization incorporated as a foundation in 1971. The core community of the World Economic Forum is the 1,000 foremost global companies. Among its publications is the annual *Global Competitiveness Report*, which analyzes and ranks 53 countries according to a unique blend of data and information taken from a worldwide survey of corporate executives.

ers per person in the labor force, the United States is outranked only by Japan; and the United States has far and away the highest share of its researchers in the business sector. The United States has more computers per person than any other country, and the most computing power.¹⁰

The United States ranked highest in a management survey of 52 countries of whether the country's companies "pioneer new products and processes" and was described as the "world leader in technology." The highest ranking for commercialization of research and adoption of new technology paints a picture of a dynamic, technologically sophisticated business sector.¹¹

With respect to financing innovative enterprises through venture capital, the United States stands head and shoulders above the competition. Among the countries surveyed for the World Economic Forum, the United States ranks first in the supply of venture capital and in the role of stock markets as a source of new capital, and it is second only to the United Kingdom in the sophistication of financial markets. Venture activity, measured as value of investments, was more than twice that of all of Europe in 1995, although by 1997 Europe was nearly on a par with the United States. According to the OECD, in terms of share of venture investments in GDP and seed capital as a share of total venture investment, the US venture industry's figures were nearly three times the European average and were greater by far than those of any individual European country.¹²

Measuring National Competitiveness

Measures of national competitiveness can combine a number of elements, such as the competitiveness of factors of production (such as labor), firms' business strategies (such as management and profit margin decisions), a country's institutions, and the country as a site for doing business (weighing features ranging from efficiency of taxation to predilection for corruption). The "Davos index" of international competitiveness generated by the World Economic Forum is an example of such a broad measure. The Davos index combines eight factors: openness, government, finance, infrastructure, technology, management, labor, and institutions. Each factor is an index created from subindexes composed of both quantitative and survey data. Quantitative data receive higher weight in the factor-indexes for openness, government, finance, and labor characteristics. Survey data

10. For patents per employee, see World Economic Forum (1998, table 5.19), and OECD (1998c, 211); for R&D indicators, see World Economic Forum (1998, table 5.15), and OECD (1998c, 210).

11. For the management survey, see World Economic Forum (1998, tables 3.06, 5.01).

12. For discussions of venture capital and financial markets, see World Economic Forum (1998, tables 3.07, 3.01); OECD (1998c, 75, table 4.2; 204, table 10.2).

receive higher weighting in the categories of infrastructure, technology, management quality, and institutions.¹³

The Davos index is a simple ranking; in this sense its value has no economic meaning either in terms of the level or of changes in competitiveness. However, using the information from the rankings of the whole set of 53 countries along with rankings of selected subindexes yields robust relationships between the rankings and issues of immediate policy relevance. For example, higher ranking in the index is correlated with faster growth in GDP per capita and with an increase in the real income of the poor (Warner 1998a, 30-37).

Conclusion

Summary

- External balance is a macroeconomic concept that rests uncomfortably on the microeconomic foundation of relative prices. Relative prices are composed of factors that the firm can control, such as profit margins, and factors that it does not control, such as exchange rates.
- By several measures of relative prices and in terms of performance in global markets, US firms are world class. Consequently, the external deficit, which some suggest indicates the “uncompetitiveness” of the US economy, is more an outcome of macroeconomic factors, such as the production-expenditure imbalance in the United States, the differences in growth rates between the United States and its trading partners, and the exchange value of the dollar.
- The preparedness of labor for future jobs, innovation and the development of new technologies, and efficiency and management of financial resources are all important elements of long-term competitiveness. While the United States is internationally competitive by many measures now, in some respects it is not preparing adequately for the future.
- Among current and future workers, many are not being adequately prepared for the jobs of the future. At least as important is the gap in performance and the widening disparity of income that comes with differences in educational attainment.
- The United States ranks very high in technological preparedness for future growth. Its companies are the most innovative, there is more financing available for new ideas, and researchers quickly commercialize their new ideas. However, by some more traditional measures

13. For a discussion of the methodology, see Warner (1998b, 78-80).

of future technological prowess, such as patent filings and R&D spending, the United States has lost its lead.

Policy Discussion

- Although the trade deficit is not a good measure of international competitiveness, it does reflect imbalances and can undermine competitiveness. Policy should address these imbalances from two macroeconomic fronts. First, savings-investment imbalances in the United States need to be rectified, with particular attention paid to household savings (for more detail, see chapters 2 and 8). Second, exchange rate misalignments such as that of the 1980s should be avoided. While the dollar has appreciated since the mid-1990s, the increase is much less than that in the 1980s, and the cause is due more to crises abroad than to a mismatch of macroeconomic policies at home. Finally, while a stable and rational mix of domestic macroeconomic policy is necessary, it is not sufficient; macroeconomic imbalances in other countries must be avoided as well.
- Over the longer term, labor force preparation and performance are critical. The United States will not be able to continue to increase its standard of living unless its workers are world class. Both future workers who are in school and current workers who are on the job deserve the best preparation and ongoing training. The evidence suggests that the needs are not being met. A partnership between the public sector, the business sector, the academic sector, the labor movement and the individual complemented by financial aid, career guidance, and personal commitment are needed to meet the challenge.
- Technological innovation has played a critical role in the continued superior performance of the US economy. While the secret ingredient to promoting technological innovation is not known, sufficient spending on R&D and a financial market that can assess prospects and provide capital to risk-takers appear to be key elements.
- The globalization of production and distribution by US firms and their affiliates is adding an additional wedge of value to the US economy that represents the competitive ability of US firms to combine resources and markets across the globe. Restricting firms' strategies toward international investment—through either domestic or foreign policies—will harm long-term US competitiveness.