

## THE EFFECT OF GLOBALIZATION ON THE DISTRIBUTION OF PRODUCTIVITY GAINS

Michael Cosgrove, College of Business, University of Dallas, Irving, TX, USA

Daniel Marsh, College of Business, University of Dallas, Irving, TX, USA

### ABSTRACT

*The integration of many previously-closed low-income countries into the world economy, starting around 1980, has been referred to as the Third Wave of Globalization. Large low-wage economies that opened to trade such as China, India, and Mexico led to an unprecedented equalization of goods prices between rich and poor countries during this time.*

*The Factor-Price Equalization Theorem, a standard part of modern trade theory, predicts that equalization of goods prices should lead to an equalization of factor prices between high-wage countries such as the United States, and low-wage countries like India and China. Unlike the Second Wave of Globalization, 1945-1980, which was primarily among rich countries with similar factor prices *ex ante*, the Third Wave of Globalization between rich and poor countries should lead to a much greater adjustment in factor prices.*

*Gains in U.S. real compensation during the Second Wave period were nearly equal to gains in productivity, as compensation of factors moved proportionally to their marginal products. However, in the 1980-2003 period, real compensation in the non-farm business sector grew at only 52 percent of the rate at which labor productivity increased. For the non-financial corporate sector, labor compensation grew at only 36 percent of the growth rate of labor productivity.*

*The purpose of our paper is to explain the breakdown in the relationship between labor productivity and compensation gains in the United States during the Third Wave period, and to consider who may be capturing those gains. We examine the possibilities that the gains may have been captured by capital in the U.S., or may have been transferred abroad to U.S. trading partners by movements in the terms of trade, and to present evidence relating to both. It appears that neither U.S. labor nor U.S. capital are fully capturing those gains and that a portion of U.S. productivity benefits are leaking out of the United States.*

### 1. INTRODUCTION

A number of dimensions of the global economy appear to have combined to contribute to growth gains in the U.S. In particular the entry of large labor-abundant economies such as China and India into the global economy, technological advances and technological diffusion along with increased mobility of factors enhanced the productive capacity of global economies. Technology development in the post-1980 U.S. was diffused globally into large labor-abundant economies allowing portions of U.S. production to shift into those countries.

Increased productive capacity shifted aggregate global supply to the right allowing product prices to move toward equalization, while increased factor mobility allows for at least partial factor-price equalization. This trend is reflected in increased trade in goods and capital flows among developing and developed countries which also acts as a substitute for perfect factor mobility. Partial mobility of factors of production occurred between the U.S. and other countries for decades as U.S. manufacturing production shifted abroad to take advantage of lower factor prices.

Globalization and diffusion of technology allowed for lower prices and increased trade which fed back into the U.S. allowing for lower technology prices and incremental use of technology across industries. Lower technology prices promote investment and transformation which contributed to faster U.S. productivity growth starting in about 1995 – the so-called “new economy era.” But gains in real compensation failed to match the increase in productivity in both the post-1980 period and in the new economy era. Factor-price equalization impacts both corporate and non-corporate compensation gains but has the larger adverse effect on corporate compensation gains in the U.S.

The U.S. appears to be moving into a stage of productivity growth where technology allows for mobility of white collar jobs, as U.S. entities can shift white collar production abroad to take advantage of lower compensation for white collar workers. Reduction of trade barriers and dispersion of technology encourages movement toward partial factor-price equalization through the exchange of goods and capital.

## **2. FRAMEWORK FOR INTERNATIONAL TRADE**

A brief review of trade theory is provided in this section including dynamic growth gains which appear to be working to contribute to U.S. increased productivity gains. Movement toward open economies and free trade is perceived to greatly offset the associated costs of movement to more open economies. The crux of the free trade argument is that individuals, companies and countries should specialize in and exchange activities in which they are relatively more efficient. The principle of trade evolved from Adam Smith's absolute advantage in 1776 to David Ricardo's comparative advantage in 1817.

Comparative advantage is the catalyst in the push toward open economies and free trade. Countries benefit when they specialize in production of goods and services in which they have a comparative advantage and exchange for goods and services from other countries that specialize and have a comparative advantage in those other goods and services. This process leads to an improvement in global income as sets of goods and services can be produced at lower costs and/or improved quality. The gain from exchange is the improvement in welfare from redistribution of an existing set of goods while the gain from specialization is the increase in total output when countries produce more efficiently.

In achieving overall aggregate gains from trade, the mix of goods and services produced in various countries may change, resulting in winners and losers. The degree of losers and winners varies from country to country but income redistribution can occur from the winners to the losers.

A later alternative explanation of comparative advantage is the Heckscher-Ohlin model of international trade. Their argument was that comparative advantage is due to differences in factor endowments among countries. Countries differ from each other in terms of not only productive resources but in how goods are produced using different proportions of those factors of production. A country is able to produce a product at a lower cost if its production uses a relatively larger proportion of a more abundant factor in that country. This model suggests therefore that a country will tend to export those products that make intensive use of factors that are locally abundant while importing those products that make intensive use of factors that are locally scarce. This model implies that the observed pattern of trade is determined by differences in factor endowments, as opposed to differences in productivity that underlie Ricardo's comparative advantage version. The Heckscher-Ohlin model is intuitively appealing but Wassily Leontief raised questions about the model's validity. This model, like the previous one, does not necessarily capture the dimensions of the losers from increased trade.

However, both versions of comparative advantage provide strong theoretical support to open economies and free trade. A limitation of comparative advantage is that it suggests countries tend to export and import unique types of goods, and one should not expect countries to be importing and exporting the same or similar goods. However 57 percent of U.S. trade in 1996 occurred within the same four-digit industrial classification as opposed to between industrial classifications. Intra-industry numbers for Japan and Europe were 20 percent and 60 percent respectively. Japan has less intra-industry trade since its factor endowments are very different from those of the U.S. and Europe (Ruffin, 1999.)

In economic sectors in which significant output levels are required to reach meaningful scale economies, it may only require a few firms to produce the necessary output for the world economy. New trade theory suggests that in particular economic sectors, countries with first movers could have a sizeable advantage if large output levels are necessary to reach scale economies. Factor endowments assume less importance in this environment, as first mover advantages may be a deciding factor. An implication of first mover advantages is that government intervention may occur in attempting to assist companies to achieve first mover advantages in sectors expected to experience scale economies at high levels of

output. Government intervention can conflict with the ideals advanced of open economies and free trade. In certain circumstances, new trade theory could lead to sizable changes in the mix of goods produced in various countries with major winners and losers.

Exchange of goods among countries can also create dynamic growth gains. Economic growth occurs due to increases in factor endowments and technological improvement. More open economies increase competitive pressures which may lead to positive impacts such as efficiency gains, increases in domestic saving, real income gains, access to capital goods and technology, technology diffusion, reduction of market power of domestic firms, faster growth in aggregate supply and access to larger markets in the global economy. Dynamic growth gains became more apparent the past twenty years as developing countries entered the globalization process.

Research and development activities in the U.S. that entered the U.S. production process were dispersed globally in the post-1980 period allowing for lower priced hardware and software to be produced abroad that, in turn, moved back into the U.S. Information technology is price elastic so the lower prices from overseas production encouraged greater capital investment in the U.S. contributing to the rapid increase in productivity. This process allows for capital to be more dispersed in the U.S. economy as well as allowing for capital deepening. This is a process leading to dynamic growth gains from free trade policies (Mann, 2003).

It is generally accepted that policies limiting movement toward free trade are likely to result in actual per capita income failing to achieve potential per capita income (Irwin and Tervio, 2001). The reverse also holds that moves toward globalization generally reduce poverty. There is strong evidence that specialization and exchange of technology lead to improvement in global income. Trade policy outcomes in the aggregate are clearly positive and the textbook analysis using community indifference curves demonstrates that.

There are many dimensions of trade such as employment and income concerns, environmental concerns, social issues and cultural concerns that may not be adequately incorporated in the aggregate outcomes. The Stolper-Samuelson theorem, as indicated, illustrates for instance that when a country imports labor-intensive goods, a segment of the country's labor force – the lower skill level workers -- tend to be losers. More recent work such as that of (Scheve and Slaughter, 2001) also illustrates the role of individual preferences, as supporters of trade barriers include those with home ownership in countries with a manufacturing mix concentrated in industries facing a comparative disadvantage. Both current factor income as well as asset values influence preferences in standard trade models.

### **3. INTERNATIONAL TRENDS**

The spread of the industrial revolution occurred during the first globalization period from 1870 to 1914. The second globalization wave -- from 1945 to 1980 -- was primarily, according to the World Bank (2002), among developed rich countries. In the second wave, institutional frameworks such as the IMF and GATT evolved toward the end of WWII and the years immediately following and served primarily developed countries. Reduction of trade barriers among these rich countries was very successful, leading to the rapid expansion in exchange of manufactured goods and gains in scale economies and productivity. Developing countries had trade barriers in place during this time period that limited trade with each other and also limited trade with developed countries.

Developing countries as a result did not participate in the growth of global manufacturing and services trade. The 1945-1980 period of globalization was among rich countries of similar heritage. The cultures are very distinct but the dimensions of the heritage of Western cultures are similar among the U.S. and Western Europe. Japan's culture, in comparison, was substantially different from that of the U.S. and Western Europe, but Japan's location, and its ability to separate the economic dimension from the religious dimension allowed Japan to fully benefit from trade in that period.

The current or third globalization wave according to the World Bank (2002) started around 1980 and had three major characteristics: 1) a group of developing countries that came into the global marketplace such

as China, India, Mexico, Malaysia, Thailand, Hungary and the Philippines that have lower cost structures than the U.S., Western Europe and Japan, 2) major increases in capital flows including human capital among developing and developed countries and 3) a group of developing countries that fell further behind, which includes most of Africa, some Middle Eastern countries and various former Russian satellite countries. Major differences between the current and previous globalization waves are that the current wave incorporates developing countries with much lower labor costs and much smaller social safety nets. In addition this globalization wave is accompanied by very large physical and human capital flows.

This third wave of globalization coincides with rightward shifts in aggregate supply of major economies, propelling a global disinflation trend in both developed and developing countries. China's economy began to open in 1980 as the leadership dismantled the adverse effects of the Cultural Revolution. Senior Leader Deng opened selected Chinese ports to foreign investment, encouraged growth of small enterprises and started to dismantle large state-owned entities. India's heavily regulated economy slowly began to open in the 1980s. It picked up speed in 1991 as Prime Minister Rao reduced tariffs and allowed private firms to compete with previously protected government monopolies. There is evidence that India's change in political power in the early 1980s resulted in that country enjoying faster rates of growth during the 1980s (Rodrik & Subramanian, 2004.) The opening of these large economies with abundant labor acted to encourage: 1) increases in aggregate supply and 2) global technology diffusion and production.

The end of the Cold War allowed more developing countries in Eastern Europe to enter the global marketplace. Mexico and Central and South America began opening their economies in the 1980s after following primarily an import-substitution trade policy. NAFTA, signed in 1993, created a free trade area in North America. Specialization and exchange allowed the benefits of free trade to flow through various channels involved in globalization -- labor, goods, capital, technology and information. Benefits of lower labor cost structures in developing economies are transmitted to the developed economies' changes in relative prices. This third wave of globalization, in essence, created global labor and capital markets where countries having an abundant resource have a competitive advantage. Developing countries such as India, China and Mexico have an abundance of available labor and low-wage rates while developed countries such as the U.S. have an abundance of capital. Both developed and developing countries enjoyed real income gains (Cosgrove, Marsh, 2003).

A life-cycle of technology development, diffusion, use, production and application evolved in the third globalization wave creating a global value chain helping to enhance U.S. productivity. The U.S. developed the technology and employed it in technology sectors. That technology became diffused into developing countries where both hardware and software were produced and applied to global businesses. Lower prices led to both capital deepening and diffusion into more industry segments in the U.S. and to corresponding dynamic growth gains.

Two trends, perhaps interdependent, appear to be occurring in the U.S. within this overall third wave of globalization. One is a partial move toward factor-price equalization and the other is faster U.S. productivity growth beginning in the mid-1990s. The impact of these two forces is resulting in slower growth in real compensation relative to productivity, and the impact is more adverse on the corporate sector.

#### **4. FACTOR-PRICE EQUALIZATION**

The Factor-Price Equalization Theorem (Samuelson, 1948, 1949) suggests that when free trade equalizes the relative prices of goods, it also equalizes the relative and absolute prices of the factors of production. In essence, if goods sell for the same price regardless of where they are produced, workers who produce them will earn equal wages. The third wave of globalization significantly increased the volume of trade between the U.S. and labor-abundant, low-income countries, and is partially equalizing factor prices.

There are several possible reasons why real wage rates have not equalized across countries. First, total factor productivity may be lower in low-income countries. Even if relative factor-price equalization takes

place, inefficient government and inadequate infrastructure and numerous market inefficiencies may limit absolute wage rates in low-income countries. Second, goods prices may not yet have equalized due to remaining trade barriers. China joined the WTO in 2002, and has not yet fully phased out its old tariff system.

Third, partial factor-price equalization does appear to be occurring, but has not yet reached a final equilibrium. During the second wave of globalization, 1945-1980, much of the increase in U.S. trade was with similar high-wage countries in Western Europe and Canada. However, during this period U.S. trade with Japan also increased, resulting in some loss of high-wage blue collar jobs in the automotive, steel, and consumer electronics industries. Trade with low-income, labor-abundant countries during the second globalization wave did not cause significant income redistribution in the U.S., as the comparative advantage of those low-income countries was usually in tropical agricultural products, where the U.S. had little domestic employment, or in non-traded goods like services. Filipina nurses could migrate to the U.S. to take jobs in American hospitals, but American consumers could not travel to the Philippines for emergency appendectomies.

Factor-price equalization in the third wave of globalization, however, is more significant for the U.S. Technology advances allow white collar service jobs to be outsourced from the developed world to countries with an abundance of educated, English-speaking workers. One source suggests that over three million U.S. white collar jobs in such areas as information technology, finance, and medical services will move to countries such as China, India, Russia, and the Philippines (Schwartz, 2003). White collar workers now make up approximately half of the unemployed in the U.S. Another source implies an “outer limit” of potential direct job loss from outsourcing is estimated at approximately 14 million workers (Bardhan, 2003).

The slower growth in real compensation rates in the U.S. compared to productivity gains started occurring in the early years of the third wave of globalization as China and India entered the global marketplace. Economic theory suggests that rapidly expanding trade with China (population 1.26 billion) and India (population 1.02 billion) could be expected to have significantly larger factor- price equalization effects on U.S. compensation growth rates. While these countries generally have much lower overall levels of total factor productivity than the U.S., “islands” of high productivity in these low-wage countries are expanding. India’s high tech area around Bangalore, and south China’s Special Economic Zones provide high levels of productivity, combined with wage rates far below U.S. levels. The “hongkongization” of portions of China as well as India appear to have acted to limit real compensation growth in the U.S.

## **5. RESULTS**

Comparison of productivity and real compensation trends in the two post-WWII globalization periods by broad economic sector allows one to see the impact of globalization on U.S. labor compensation trends. The two sectors are: 1) nonfarm business and 2) nonfinancial corporate where nonfarm business accounts for approximately 75 % of U.S. GDP while nonfinancial corporate makes up roughly 50% of GDP.

The 1945 to 1980 time frame was characterized by trade among developed rich countries while the post-1980 stage incorporates trade among developing and developed countries. Data in the following tables for the stage of trade among developed countries begins in 1951 – not 1945.

### **5.1 Nonfarm Business**

Gains in real hourly compensation approximately matched gains in labor productivity for the nonfarm business sector over the 1951-1979 period and the two sub-periods – 1951-1965 and 1966-1979. The proximity of the gains in productivity and compensation is consistent with standard neoclassical distribution theory, in which compensation of factors is proportional to their marginal products. See for example Clark (1908) or Ferguson (1969).

However, during the 1980-2003 time frame, real hourly compensation of U.S. workers grew at only 52 percent of the rate at which labor productivity increased, compared to the 90 percent range in the prior

time periods. This anomaly needs to be explained when compensation of factors is supposed to be proportional to marginal productivity.

Some amount of this difference may be due to measurement errors in the price deflators used for the respective series by the Bureau of Labor Statistics. However, our thesis is that a major cause of the decoupling of real wage gains and productivity gains or the wage gap in the U.S. in the 1980-2003 period is factor-price equalization. In this third wave of globalization, the U.S. experienced an unprecedented volume of trade with large, poor but labor-abundant countries. Workers in the U.S. are no longer competing against each other or against workers in other rich countries. They are now competing against skilled, educated workers in places such as Mexico, China and India, where real wages are substantially less.

**TABLE I NONFARM BUSINESS SECTOR  
LABOR PRODUCTIVITY V. REAL COMPENSATION\***  
(average annual percentage change)  
(Quarterly data)

<u>Time Frame</u>	<u>Output/hr.</u>	<u>Real Comp./ hr.**</u>	<u>Gap</u>	<u>Comp. Inc./ Output Inc.</u>
<u>1951-2003</u>	2.27	1.75	0.52	77.1
<u>1951-1979</u>	2.48	2.31	0.17	93.1
<u>1951-1965</u>	2.89	2.81	0.08	97.2
<u>1966-1979</u>	2.01	1.76	0.25	87.6
<u>1980-2003</u>	2.0	1.04	0.96	52.0
<u>1980-1994</u>	1.57	0.70	0.87	44.6
<u>1995-2003</u>	2.71	1.6	0.89	59.0

\*Compensation = wages and salaries plus private benefit plans and employers' contributions for social insurance.

Source: BLS

Hourly compensation costs for production workers in 2002 varied from \$2.38 in Mexico, \$2.57 in Brazil, \$5.41 in Taiwan, \$18.83 in Japan, \$21.33 in the U.S. and \$26.18 in Germany (former West.) Compensation costs include wages and salaries plus benefits (U.S. Department of Labor, 2003). Johnson (2003) estimates that the hourly wage rate in China is approximately \$0.40. Chen (2003) estimates the hourly wage rate of Chinese manufacturing workers is about two percent of the U.S. average manufacturing hourly wage rate.

## 5.2 Nonfinancial Corporate

Nonfinancial corporate is the portion of the business sector that participates most directly in globalization and is most exposed to globalization through many channels including trade, labor, technology and capital flows. Percentage increases in productivity and real compensation data weren't available before 1959 for the nonfinancial corporate sector so the time periods for this sector are not exactly consistent with the nonfarm business sector. However enough information is available for comparison in most time periods.

Real hourly compensation gains of the nonfinancial corporate sector, in general, lag growth in productivity by more than the nonfarm business sector. The gap between hourly output and real hourly compensation

was less than one percent per year during the new economy period for the nonfarm business sector but was nearly 1.7 percent for the nonfinancial corporate sector. This latter sector is the one most exposed to the economics of globalization as nonfinancial corporate includes large corporations directly involved in globalization that create global value-added supply chains which effectively organize highly competitive global production and distribution systems. In turn this process impacts growth in compensation and expectations of compensation growth.

**TABLE II NONFINANCIAL CORPORATE  
LABOR PRODUCTIVITY V. REAL COMPENSATION\***  
(average annual percentage change)  
(quarterly data)

<u>Time Frame</u>	<u>Output/hr.</u>	<u>Real Comp./ hr.*</u>	<u>Gap</u>	<u>Comp. Inc./ Output Inc.</u>
<u>1959-2003</u>	2.13	1.19	0.9	0.56
<u>1959-1979</u>	2.08	1.67	0.41	0.80
<u>1959-1965</u>	3.06	1.97	1.09	0.64
<u>1966-1979</u>	1.60	1.52	0.08	0.95
<u>1980-2003</u>	2.17	0.78	1.39	0.36
<u>1980-1994</u>	1.54	0.32	1.22	0.21
<u>1995-2003</u>	3.21	1.54	1.67	0.48

\*Compensation = wages and salaries plus private benefit plans and employers' contributions for social insurance.

Source: BLS

Factor-price equalization is likely the largest force contributing to sub-par growth in labor compensation relative to productivity, taking a more prevalent role in nonfinancial corporate sector. The Stolper-Samuelson theorem could also partially explain why increases in U.S. real compensation lag U.S. productivity increases. This theorem suggests that scarce resources for the U.S. are labor and labor compensation levels while capital is the abundant factor. In comparison, labor and low-wage rate levels are the abundant factors for developing countries such as India, China and the Philippines. Growth trends in real compensation occurring in the U.S. are implied by the globalization forces, in particular factor-price equalization. Plus a combination of labor immigration to the U.S. as well as outsourcing of jobs from the U.S. to developing countries may act to dampen U.S. worker expectation of real compensation increases and reinforce the slowdown.

Most accept the idea that compensation levels offered by firms are directly related to worker productivity because higher productivity makes it more attractive for firms to increase employment and they are able to do so by increasing the wage offered to workers (Trehan, 2001). But in a global economy with a global labor force via outsourcing and technology developments, U.S. firms over the past two decades no longer need to increase their compensation packages as much as before to attract workers. U.S. firms can hire people in India, China and other developing countries instead of the U.S.

### 5.3 Nonfinancial Corporate Profits

This potentially allows for a higher return to capital under the premise that the decision to hire workers outside the U.S. is cost-effective. Returns to capital can be measured by before-tax nonfinancial corporate profits. A higher return to capital, however, did not occur in the post-1980 period as illustrated in Table III. In fact the post-1980 share of the nonfinancial corporate selling price going to profits is lower than in the pre-1980 period. The non-labor cost portion which includes consumption of fixed capital, indirect taxes and net interest did, however, increase in the post-1980 time period by roughly the amount that profits decreased. Compensation's share was virtually unchanged between the Second and Third Waves.

**TABLE III NONFINANCIAL CORPORATE  
B.T. PROFITS, NONLABOR COSTS & COMPENSATION\***

Shares of One Dollar  
(quarterly data)

<u>Time Frame</u>	<u>B.T. Profits</u>	<u>Non-labor Costs</u>	<u>Comp. Costs</u>
<u>1951-2003</u>	12.84	21.67	65.49
<u>1951-1979</u>	15.10	19.73	65.17
<u>1951-1965</u>	17.17	18.53	64.30
<u>1966-1979</u>	12.87	21.02	66.11
<u>1980-2003</u>	10.13	24.02	65.85
<u>1980-1994</u>	9.78	24.20	66.02
<u>1995-2003</u>	10.71	23.73	65.56

\* Comp. Costs = Compensation Costs

Source: Department of Commerce, Bureau of Economic Analysis

The so-called New Economy period is typically given a start date around 1995. Profits improved slightly in the post-1994 period but not enough to reflect the sizeable gap between productivity growth and real compensation growth for the nonfinancial corporate sector. So the real return to capital didn't improve enough to account for the sub-par performance of real compensation growth.

### 5.4 Distribution of Gains

National income captures gains going to different sectors such as employee compensation, proprietors' income, rental income, corporate profits as well as net interest. Comparison of growth in national income to growth in the core CPI between the Second and Third Globalization Waves allows an approximation of the possible gains from trade, Table IV. U.S. income recipients earned more after inflation – about two percentage points more -- when trade was primarily among rich developed countries – the Second Wave. Performance in the “new economy era” – 1995 and later – shows an improvement in real income gains but the rate remains below that experienced in the Second Wave.

**TABLE IV NONFARM BUSINESS SECTOR  
NATIONAL INCOME V. CORE CPI**  
(average annual percentage change)  
(Quarterly data)

<u>Time Frame</u>	<u>National Income</u>	<u>Core CPI</u>	<u>Gap</u>
<u>1959-2003</u>	7.29	4.29	2.99
<u>1959-1979</u>	8.40	4.35	4.05
<u>1959-1965</u>	6.67	1.45	5.21
<u>1966-1979</u>	9.26	5.80	3.46
<u>1980-2003</u>	6.32	4.24	2.08
<u>1980-1994</u>	6.95	5.36	1.58
<u>1995-2003</u>	5.26	2.37	2.89

Source: Department of Commerce, BEA and BLS

### 5.5 The Division of Gains Internationally

Another possibility is that robust labor productivity gains in the U.S. are going to foreigners if workers in the United States are not capturing improvements in labor productivity through higher real wages. Critics of globalization argue that workers in high-wage countries are forced by free trade to compete against exploited workers in third world countries. If gains from high labor productivity in the U.S. were being captured by foreign workers, it should show up as something equivalent to immiserizing growth. That is, the terms of trade of the U.S. should have fallen during the Third Wave period. We examine this possibility by calculating the terms of trade of the United States over both the Second and Third Wave periods. The terms of trade is defined as the ratio of the export price index divided by the import price index, Table V.

**TABLE V TERMS OF TRADE**  
Export Price Index/  
Import Price Index

Time Frame	
1951-2003	1.16
1951-1979	1.29
1951-1965	1.31
1966-1979	1.27
1980-2003	0.99
1980-1994	0.99
1995-2003	1.01

Source: Department of  
Commerce,  
BEA

The terms of trade clearly did fall in the Third Wave period compared to the Second Wave time frame. In the Second Wave period, trade resulted in an improvement in the welfare of the U.S. as the U.S. obtained more in return for what it gave up. In comparison, the U.S. appears to be giving up approximately what is obtained in the post-1980 period -- trade among developing and developed countries. Terms of trade support the Second Wave real income advantage of approximately two percentage points over the Third Wave -- see section 5.4. Trade in the Third Wave of Globalization may be consistent with U.S. exporters needing to decrease their selling prices in order to effectively compete with output from the emerging market economies. In doing that, the U.S. moved, according to the terms of trade, from welfare enhancing in the Second Wave to an approximately neutral one in terms of trade during the Third Wave.

This change in the terms of trade from the Second to the Third Wave appears to be consistent with Factor-Price Equalization Theorem suggesting movement toward partial equalization of factor prices. The process for that partial equalization appears to be occurring through the income channel as real income growth averages only 52 percent of the increase in labor productivity for the nonfarm sector and 36 percent for the nonfinancial corporate sector in the Third Globalization Wave. It appears that a portion of the U.S. productivity gains during the current period of globalization are leaking out of the U.S. However since the terms of trade are neutral in the Third Wave, growth in the current wave cannot be called immiserizing.

## 6. SUMMARY

The Third Wave of globalization – post-1980 – generated worldwide improvements in productivity and large gains from trade, leading to increases in real income that were shared among the developed and developing countries which moved toward free trade. Gains in the Second Wave of globalization, in comparison, were primarily shared among the developed countries only.

Gains in U.S. real compensation during the Second Wave were nearly equal to gains in productivity, as compensation of factors moved proportionally to their marginal products. However, in the 1980-2003 period, real compensation in the non-farm business sector grew at only 52 percent of the rate at which labor productivity increased. For the nonfinancial corporate sector, labor compensation grew at only 36 percent of the growth rate of labor productivity. Standard neoclassical distribution models fail to account for these shortfalls. The decoupling of compensation from productivity may be a consequence of international trade, as the U.S. experienced an unprecedented expansion of trade with large, poor, labor-abundant countries during the Third Wave. U.S. workers have been increasingly forced to compete with skilled, educated workers in countries such as India, China, and Mexico, where real wages are substantially less.

Factor-Price Equalization can explain the depressing of labor compensation in rich countries like the U.S. However, it predicts in turn that the real return to capital should rise in capital abundant countries that export to capital scarce countries. Data on nonfinancial corporate profits in the U.S. as a share of sales do not support this prediction, being significantly lower in the Third Wave period. Also, real income increased at a significantly faster rate in the Second Wave period, compared to the Third. Finally, the terms of trade of the U.S. fell significantly from the Second Wave period to the Third Wave period, suggesting much of the improvement in labor productivity in the U.S. has recently leaked away as lower prices to foreign consumers.

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### **Author Profiles**

Dr. Michael H. Cosgrove earned his Ph.D. at Ohio State University. Currently he is an associate professor in the College of Business, University of Dallas.

Daniel Marsh, ABD, Southern Methodist University. Currently he is adjunct professor in the College of Business, University of Dallas.