WHY IS THE UNITED STATES SPECIAL?
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ABSTRACT: The United States experienced a trade deficit every year since 1976. Even though the trade deficit was no greater than 2.5% of nominal gross domestic product on average, its persistence had accumulated in foreign debts amounted to $12 trillions or 60% of 2017 GDP. This study used the Bureau of Economic Analysis data from 1929 to 2017 and Yahoo Finance data from 1950 to 2017 to determine the effects of the persistent trade deficit and the accumulation of foreign debts on the US economy. The main results of the study are (a) the trade deficit supported an increase in personal consumption without significantly affecting inflation, private investment, or government spending, (b) the infusion of funds from abroad succeeded in supporting employment or wage or both for some sectors but failed in supporting employment or wage or both for other sectors, (c) thus despite the positive effects of trades the US economy continued to decelerate and this deceleration was more rapid since 1976. JEL codes: E01, F01, G01, J01.

1. INTRODUCTION

When this study was undertaken during the month of October 2018, trades was a popular topic in America. The Trump Administration had declared war on trades, contended the Press, with anti-trade policies, particularly the tariffs on imports (1). Many notable trade experts and economists, among them Laura Tyson who headed the Council of Economic Advisers under the Clinton Administration, appeared in the Press to publicly denounce the Administration's trade policies (2).

In defense, the Administration cited the need to reduce the trade deficits and to promote American industries. Indeed, the United States has experienced a trade deficit every year since 1976. Even though the trade deficit was no greater than 2.5% of nominal gross domestic products on average, its persistence has accumulated in foreign debts amounted to $12 trillions or 60% of 2017 GDP or gross domestic products.

In the midst of these debates, investors of American companies, presumably neutral due to their appetites for profits, reacted unfavorably towards the Administration's trade policies. Major stock indices dropped in value every time the Administration announced a new trade policy development (3).

This study is an attempt to resolve the issues of trades in view of the current debates. The effects of the persistent trade deficit and the accumulation of foreign debts on the US economy are analyzed using data from the Bureau of Economic Analysis from 1929 to 2017, particularly Table 1 on National Income and Products, Table 4 on Foreign Transactions, and Table 6 on Wage and Employment, and data from Yahoo Finance from 1950 to 2017.

The methodology of the study emphasizes on chart analyses and ordinary least squares regressions or OLS regressions. The innovation of the methodology is the use of moving averages to minimize noise in chart analyses and the use of lagged independent variables to minimize correlation between independent and dependent variables in OLS regressions.

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consumption without significantly affecting inflation, private investment, or government spending, (b) the infusion of funds from abroad succeeded in supporting employment or wage or both for some sectors but failed in supporting employment or wage or both for other sectors, (c) thus despite the positive effects of trades the US economy continued to decelerate and this deceleration was more rapid since 1976.

The rest of the paper is organized as follows: Section II includes analyses of trades on economic growth, Section III includes analyses of trades on employment and wage, Section IV includes analyses of trades on financial markets, a discussion is presented in Section V, and a conclusion in Section VI.

II. DECLINING ECONOMIC GROWTH

A. Extent of Markets

The benefit of trades is well known though it was Adam Smith, an 18th century philosopher, who explained it best (4). Trades make it possible for men to focus on producing things most appropriate to their talents and resources, since they can exchange the surpluses of their products for other men's products, so that each and every man can benefit from consuming as many as possible all the available different products. The benefit of trades is limited only by the extent of the markets in which these products are traded.

Due to the benefits of trades, countless empires rose and fell over the course of history: the Roman empire began in the 1st century and spread from Italy to much of Europe until the 5th century; the Mongol empire began in the 13th century and spread from Mongolia to much of Asia and Europe until the 14th century; the Spanish empire began in the 15th century and spread from Spain to much of America, Africa, and Asia until the 19th century; the British empire began in the 16th century and spread from England to much of America, Africa, India, Asia, and Oceania until the 19th century (5).

By the 20th century, it was no longer necessary to conquer empires to benefit from trades. Small and less developed countries, such as post-war Japan and the four Asian Tigers, Hong Kong, Singapore, South Korea, and Taiwan, were able to access the world markets and after rapid industrialization were able to supply products for the world consumption. Access to the world markets and command of advanced technologies helped many export oriented countries to become as wealthy in terms of real GDP as high income countries within the short time span of a few decades (5).

B. National Income

Globalization, on the other hand, has contributed to US economic decline. The US economy grew more slowly following the end of World War II, and the decline was more rapid when the country entered the trade deficit era in 1976, as shown on Chart 1, which includes the 3-year moving-averaged trajectories of the annual percentage change of real and nominal GDP and the trajectories of the annual trade deficit accumulation and annual net foreign borrowing accumulation as percent of GDP from 1932 to 2017 (6).

The average annual percentage change of real GDP was 3.3% from 1930 to 2017, 3.1% from 1947 to 2017, and 2.8% from 1976 to 2017. The rate of economic growth did not decline from 1947 to 1966 during which time the average annual percentage change of real GDP was 4.0%.
nominal terms, the economy grew at an average annual rate of 6.4% from 1930 to 2017, 6.5% from 1947 to 2017, 6.0% from 1976 to 2017, and 6.6% from 1947 to 1966.

The rapid decline in the rate of economic growth from 1976 to 2017 coincided with the increase in the accumulation of annual trade deficits, or the accumulation of annual net foreign borrowings. The accumulation of annual trade deficits, or the accumulation of annual net foreign borrowings, as percent of GDP was negative from 1947 to 1981, on average -2% from 1929 to 1947, and -10% from 1947 to 1966, and positive from 1981 to 2017, increasing on average 1.6 percentage points per year. This coincidence suggests that the trade deficits facilitated the decline in the rate of economic growth.

Identifying coincidence and correlation between variables of interests is the main task of chart analyses. The use of 3-year moving averages, $Y_{MA,3}(t) = (Y(t) + Y(t-1) + Y(t-2))/3$, $t$ in years, smoothes out year-to-year fluctuations and makes it easier to identify coincidence and correlation between variables. Application of economic theories is also important.

For example, a trade deficit is expected to decrease national income, the value of all final goods and services produced in a country a year, which are eventually sold for personal consumption, private investment, government spending, and exports, since imports, purchased with national income, reduce GDP and incur foreign debts if exceeded beyond exports. The accumulation of annual trade deficits equals to the accumulation of incurrence of foreign liabilities net acquisition of foreign assets.

The extraordinary increase in the rate of economic growth from 1947 to 1966 coincided with the US implementation of the Marshall plan (7) and US confrontation with the Cold War (8). This coincidence suggests that the US economy grew faster when supplying for European reconstruction and for military operations in Southeast Asia and elsewhere.

The precise estimates of the decline in the rate of economic growth obtained by OLS regressions are presented in Table 1. In real terms, the statistically significant decline in the annual rate of economic growth in percentage points is 0.03 per year from 1947 to 2017 and 0.05 per year from 1976 to 2017. In nominal terms, the statistically significant decline in the annual rate of economic growth in percentage points is 0.06 per year from 1947 to 2017 and 0.19 per year from 1976 to 2017.

The data on Chart 1 also suggests that the trade deficits helped to temper inflation. Inflation is the difference between nominal and real economic growth. The gap between nominal and real economic growth rates began to narrow from nearly 10% in the 1970s to about 2% in subsequent decades. On average, the annual inflation rate was 3.1% from 1930 to 2017, 3.4% from 1947 to 2017, and 3.2% from 1976 to 2017.

The finding on inflation, even though macroeconomic in nature and simplistic in methodology, is consistent with a large body of academic research. In the most recent paper, published at the 2019 ASSA Annual Meetings, Xavier Jaravel and Erick Sargel reported that the 2000-2007 Consumer Price Index, compiled by the Bureau of Labor Statistics, fell after the approval of trade policies favoring Chinese imports, such as tariffs reduction (9).

C. Expanded Details of National Income

Expanded details of national income are analyzed to further understand how the trade deficits
affect the economy. As shown on Chart 2, which includes the 3-year moving-averaged trajectories of personal consumption, private investment, net export, and government spending as percentage shares of GDP from 1932 to 2017, the trade deficit supported an increase in personal consumption without significantly affecting private investment or government spending.

Personal consumption increased when the United States entered the trade deficit era, from 1976 to 2017, while private investment and government spending remained relatively stable. This is in contrast to the Great Depression era, from 1932 to 1939, when an increase in personal consumption was accompanied by a decrease in private investment, and the World War era, from 1941 to 1946, when an increase in government spending was accompanied by a decrease in personal consumption and private investment (6). The US net export was negligible during these time periods.

The increase in personal consumption, as percentage share of GDP, was due to increases of expenditures on services, as shown on Chart 3, which includes expanded details of personal consumption, 3-year moving-averages, from 1932 to 2017.

After World War II, as percentage shares of total personal consumption, expenditures on food and beverages, clothing, and furnishings decreased; expenditures on healthcare services, finance services, transportation services, and housing services increased; expenditures on gasoline and energy goods remained relatively stable then decreased slightly after 1980; and expenditures on motor vehicles remained relatively stable then decreased slightly after 2000 (10).

The stability in private investment, as percentage share of GDP, was due to increases in investments on intellectual property products, as shown on Chart 4, which includes expanded details of private investment, 3-year moving-averages, from 1932 to 2017.

After World War II, as percentage shares of total private investment, investments on structures, equipment, and residential remained relatively stable until the mid 1960s when investments on residential declined, until the early 1980s when investments on structures declined, and until the late 1990s when investments on equipment declined; only intellectual property product investments experienced a steady increase since 1953 (11).

These results suggest that the trade deficits enabled American consumers to spend more on services, particularly healthcare, finance, transportation, and housing services, and American producers to spend more on intellectual property product investments, particularly software, research and development, and entertainment.

D. Regression Analyses of National Income

The precise estimates of the differential impacts of personal consumption, government spending, private investment, and net export on economic growth are presented in Table 2. OLS regressions are used to obtain the estimates and lagged values of personal consumption, government spending, private investment, and net export are used as independent variables to minimize correlation between independent and dependent variables.

OLS regressions of contemporaneous variables can be problematic due to correlation. Since national income equals the sum of personal consumption, government spending, private investment, and net export, OLS regressions of personal consumption, government spending, private investment, and net export on national income would result in perfect correlation, also
known as the identity problem. Using lagged independent variables would eliminate the identity problem. For examples, last period investments might have an effect on this period income not because of identity but because investments yield a return.

Regression analyses estimate that 1% increase in personal consumption, government spending, private investment, and net export lead to respectively 0.5%, 0.14%, 0.06%, and 0.002% increase in economic growth, based on annual data from 1929 to 2017; and respectively 0.9%, -0.04%, -0.05%, and 0% increase in economic growth, based on annual data from 1960 to 2017, though only the personal consumption estimate is statistically significant.

Based on quarterly data from 1947 to 2017, regression analyses estimate that 1% increase in personal consumption, government spending, private investment, and net export lead to respectively 0.5%, 0.06%, 0.03%, and 0% increase in economic growth, though only the personal consumption and private investment estimates are statistically significant; and respectively 0.7%, -0.05%, 0.01%, and 0% increase in economic growth, based on quarterly data from 1960 to 2017, though only the personal consumption estimate is statistically significant.

These results suggest that personal consumption, government spending, private investment, and net exports were in the listed order of importance drivers of US economic growth, though after World War II only personal consumption and private investment remained the major drivers, and after 1960 only personal consumption remained the major driver. They also suggest the existence of crowding outs where an increase of impact due to one spending lead to a decrease of impact due to another spending. The impact of trades was nontrivial though small compared to the impact of other components of national income.

E. Summary

The results from these analyses demonstrate that the US economy is resilient in response to internal and external forces deterring it from its "manifest destiny", to use the term attributed to 19th century Americans in their zeal to expand their domains westward. The manifest destiny of the US economy is to maintain the growth path charted out as a consequence of the events occurring from 1929 to 1946 during which time the US economy grew super-extraordinarily fast, thanks to the super-extraordinary effort of the US government and its citizens.

Indeed, the trade deficits of the last 40 years were useful in maintaining an increase in personal consumption without significantly affecting inflation, private investment, or government spending.

However, the nature of US demographic and economic distribution -- as reflected in the increase of personal consumption due mainly to the substitution from expenditures on food and beverages, clothing, and furnishings into expenditures on healthcare, finance, transportation, and housing services, and in the stability of private investment due mainly to the substitution from investments on structures, equipment, and residential into investments on intellectual property products -- poses significant challenges to US manifest destiny going forward.

III. DECLINING EMPLOYMENT AND WAGE GROWTH

A. Division of Labor

According to Adam Smith, trades make it possible for markets to extend, thereby for profits to augment, and for industry to improve, and vice versa, since "when the market is very small, no
person can dedicate himself entirely to one employment, for want of the power to exchange all that surplus of produce of his own labor" and "it is natural that the first improvements of industry should be the convenience to open the whole world to the produce of every sort of labor (4)".

Due to the benefits of trades, countless number of contrivances, among them wheels and roads, ships and planes, computers and telephones, were devised to transport cargos and people on land, over sea, and in the air. Men had taken up these endeavors, most likely, as early as when they walked the earth thousands of years ago, and they would not stop, most likely, in these endeavors even beyond the confines of the earth, for "there exists in human nature the propensity to truck, barter, and exchange one thing for another (4)".

It is uncertain whether the propensity to truck, barter, and exchange is in every man's nature though it is certain the world is according to Adam Smith. The world was open to the produce of every sort of labor, even from small and less developed countries, by the end of the 20th century. Thanks to the imports from the rest of the world, even small and less developed countries, the United States was able to devote more of national income to personal consumption without sacrificing private investment and government spending.

Even though the US economy decelerated following the end of World War II, and this deceleration was more rapid since 1976, the US economy continued to grow however slightly less each year. The following analysis is thus an attempt to determine the reasons behind the discontentment over trades, as exhibited in the Administration's recent anti-trade policies.

B. Employment

Correlated to real GDP, employment in the United States grew more slowly following the end of World War II, and the decline was more rapid since 1976, as shown on Chart 5 which includes the 3-year moving-averaged trajectory of the annual percentage change of employment from 1932 to 2017. The magnitude of the decline in the growth of employment however is less pronounced.

The annual percentage change of full-time equivalent employees was on average 1.6% from 1930 to 2017, 1.5% from 1947 to 2017, and 1.4% from 1976 to 2017 (12). During the 20 years when the United States implemented the Marshall plan and confronted the Cold War, from 1947 to 1966, the growth rate of employment, at 1.8%, surpassed all other time periods.

Chart 6 includes the 3-year moving-averaged trajectories of employment across sectors, measured by the number of full-time equivalent employees, from 1932 to 2017. Employment in agriculture (13), manufacturing (14), and wholesale remained constant or rose slightly until 2000 when it fell; employment in services (15), retail, and government rose significantly; employment in construction, transportation, and finance (16) rose slightly; and employment in mining (17) remained relatively constant.

Chart 7 includes the 3-year moving-averaged trajectories of employment across sectors, measured as percentage share of total employment, from 1932 to 2017. Services and retail were the major gainers with employment rising significantly; manufacturing was the major losers with employment falling significantly; finance, construction, and wholesale were the minor gainers with employment rising slightly; agriculture, mining, and transportation were the minor losers with employment falling slightly; and government was neither a gainer nor a loser with
employment remaining constant.

The precise estimates of the decline in the annual percentage change of full-time equivalent employees, obtained from OLS regression analyses based on 1957-2017 data, are presented on the left side of Table 3. Employment across all sectors grew, at the rate of 2.6% per year, and it did not grow more slowly over time, as the estimate of the decline in growth rate, 0.02 percentage points per year, is statistically insignificant. Only employment in agriculture, mining, and transportation declined, though these estimates are statistically insignificant.

Employment in finance, services, government, wholesale, and retail grew fastest, respectively, 5.4%, 5.1%, 4.0%, 3.7%, and 3.5%, though employment in these sectors grew more slowly each year, declining respectively 0.06, 0.03, 0.05, 0.03 (statistically insignificant), and 0.05 percentage points per year. Employment in manufacturing and construction grew, respectively, 2.3% and 1.9%, though the growth rates declined 0.05 (statistically insignificant) and 0.01 percentage points per year.

The results from these analyses suggest that the trade deficit did not affect overall employment significantly, however, its greatest impact is shifting employment from some sectors to other sectors, particularly from manufacturing and transportation into services, retail, and finance.

The finding on employment, particularly in manufacturing, is consistent with a large body of academic research. In the most recent paper, published at the 2019 ASSA Annual Meetings, Katharine Abraham and Melissa Kearney reported that based on 1999-2016 Consumer Product Surveys and Bureau of Labor Statistics data trades and automation were the most important drivers for the decline in manufacturing employment (18).

C. Wage

Correlated to nominal GDP, wage in the United States grew more slowly following the end of World War II, and the decline was more rapid since 1976, as shown on Chart 5, which includes the 3-year moving-averaged trajectory of the annual percentage change of wage from 1932 to 2017. The effect of trades on wage however is more pronounced.

The annual percentage change of wage and salary per full-time equivalent employee was on average 4.5% from 1930 to 2017, 4.7% from 1947 to 2017, 4.3% from 1976 to 2017, and 4.8% from 1947 to 1966.

During the 20 years after World War II, the growth rate of real GDP during the 1947-1966 period exceeded the corresponding growth rate during the 1930-2017 period by 0.7 percentage points while the growth rate of nominal GDP, employment, and wage during the 1947-1966 period exceeded the corresponding growth rates during the 1930-2019 period only by 0.2 to 0.3 percentage points, suggesting that profits were not sufficiently distributed into the labor force, either through employment or wage, during the 1947-1966 period.

However, during the subsequent 14 years, from 1967 to 1981, wage grew faster than real GDP or employment, on average 7.2% per year, suggesting that civil and labor rights movements (19), which were prominent during this time period and which were reactionary to the previous time period, played as an important a role in the wage increase as did the oil price crisis which also occurred during this time period (20).
After 1976, the growth rate of wage declined in concert with the growth rates of real GDP, nominal GDP, and employment, though the effect of trades on wage is more pronounced.

The growth rate of wage during the trade deficit era was below the corresponding growth rate during the 1947-2017 period by 0.4 percentage points, while the growth rates of real GDP, nominal GDP, and employment during the trade deficit era were below the corresponding growth rates during the 1947-2017 period by only 0.3, 0.5, and 0.1 percentage points respectively. This suggests that the larger decline in the growth rate of wage was a concession to smooth out the smaller decline in the growth rate of employment. This difference is about 0.1 percentage point.

Chart 8 includes the 3-year moving-averaged trajectories of wage and salary per full-time equivalent employee for all sectors from 1932 to 2017. Wage and salary per full-time equivalent employee for all sectors rose from 1932 to 2017 though these increases became smaller and smaller over time. Employees in mining and finance were the top earners, employees in wholesale, transportation, manufacturing, government, construction, and services were the middle earners, and employees in agriculture and retail were the bottom earners.

Chart 9 includes the 3-year moving-averaged trajectories of wage and salary per full-time equivalent employee for all sectors as percentage share of total wage per full-time equivalent employee across sectors from 1932 to 2017. Wages in mining, finance, and services increased significantly; wages in construction, retail, and transportation decreased significantly; wages in agriculture, manufacturing, wholesale, and government remained relatively stable. Changes in mining, finance, construction, and transportation wages began in mid-1970s; and changes in services and retail wages began in late 1940.

The precise estimates of the decline in the annual percentage change of wage and salary per full-time equivalent employee, obtained from OLS regression analyses, based on 1957 to 2017 data, are presented on the right side of Table 3. The average wage across all sectors grew, at the rate of 7.7% per year, though the growth rate declined 0.05 percentage points per year. The wage for each sector grew consistently between 6.8% to 10%, and the growth rate for each sector declined consistently between 0.04 to 0.08 percentage points per year.

In contrast to the employment estimates, the wage estimates, whether the growth rate estimates or the decline of growth rate estimates, were uniform across all sectors suggesting that political factors played as important a role in wage determination as economic factors in response to the effects of trades.

The finding on wage is consistent with a large body of academic research. In the most recent papers, published at the 2018 ASSA Annual Meetings, Simcha Barkai reported that labor compensation for US non-financial sector, computed using National Income and Productivity Accounts data from 1984 to 2014, declined or stagnated (21), and David Autor, David Dorn, Lawrence Katz, Christina Patterson, and John Van Reenen reported that labor compensation, computed using various US data and EU data, declined (22); the decline in labor compensation they argued was most likely due to falls in profits.

D. Regression Analyses of Employment and Wage

The precise estimates of the differential impacts of personal consumption, government spending, private investment, and net export on employment and wage are presented in Tables 4
Estimates in Tables 4 and 6 are based on annual data from 1929 to 2017. Estimates in Tables 5 and 7 are based on annual data from 1957 to 2017. OLS regressions are used to obtain the estimates, and lagged values of independent variables are used to minimize correlation between independent and dependent variables.

As shown on Table 4, personal consumption is more important for transportation, services, finance, retail, wholesale, mining, and agriculture, 1% increase in spending leads to respectively 0.38%, 0.32%, 0.31%, 0.22%, 0.20%, 0.18%, and 0.03% increase in employment; government spending is more important for government and manufacturing, 1% increase in spending leads to 0.47% and 0.15% increase in employment; private investment is more important for construction and manufacturing, 1% increase in spending leads to 0.20% and 0.13% increase in employment.

After World War II, as shown on Table 5, personal consumption remains important for services, finance, and retail, 1% increase in spending leads to respectively 0.35%, 0.33%, and 0.33% increase in employment; government spending remains important, 1% increase in spending leads to 0.26% increase in employment for government, however, 0.78%, 0.46%, 0.34%, and 0.21% decrease in employment for respectively construction, transportation, manufacturing, and retail. These are the only statistically significant estimates. The estimates on government spending suggest crowding outs as employment shifted from some sectors to other sectors.

The estimates on net export are small though statistically significant for manufacturing and transportation, 1% increase in net export leads to 0.002% in employment, as shown in Table 4. After World War II, 1% increase in net export leads to 0.002% decrease in employment for manufacturing, as shown in Table 5. These results suggest that the trade effects on employment in manufacturing differed before and after World War II.

With respect to wage, as shown on Table 6, personal consumption is important for all sectors, 1% increase in spending leads to 0.45% to 0.68% increase in wage; government spending is important for agriculture, construction, manufacturing, mining, services, and transportation, 1% increase in spending leads to respectively 0.21%, 0.14%, 0.10%, 0.07%, 0.06%, 0.05% increase in wage; private investment is important for construction, agriculture, finance, government, and services, 1% increase in spending leads to respectively 0.08%, 0.09%, -0.05%, -0.05%, and -0.04% in wage.

As shown on Table 7, personal consumption remains important for all sectors except agriculture, 1% increase in spending leads to 0.34% to 0.61% in wage; government spending remains important for construction, manufacturing, and services, 1% increase in spending leads to respectively 0.24%, 0.23%, and 0.17% increase in wage; private investment remains important in agriculture, 1% increase in spending leads to 0.23% increase in wage.

After World War II, government spending becomes important for government and retail, 1% increase in spending leads to 0.20% and 0.13% increase in wage; private investment becomes important for government, 1% increase in spending leads to 0.06% decrease in wage. These estimates suggest wage shifted from some sectors to other sectors.

The estimates on net export are small though statistically significant for agriculture, mining,
and construction, 1% increase in net export leads to 0.002% to 0.003% increase in wage, as shown in Table 4. After World War II, however, estimates on net export becomes statistically insignificant, as shown in Table 5. These results suggest that trade impacts on wage are nontrivial however small.

E. Summary

These analyses provide additional evidence for the US economy's resilience. In response to competition abroad, US producers cut employment and wage. However, the reduction in the number of full-time equivalent employees of some sectors, mainly manufacturing, was made up with the augmentation in the number of full-time equivalent employees of other sectors, mainly services and retail. And similarly, the reduction in wage and salary per full-time equivalent employee of some sectors, mainly retail, construction, and transportation, was made up with the augmentation in wage and salary per full-time equivalent employee of other sectors, mainly finance, mining, and services.

This shifting succeeded in maintaining overall employment, with US employment growing moderately, but failed in maintaining corresponding overall wage, with US wage declining moderately. This dichotomy poses significant challenges to the US economy going forward, especially its manifest destiny to maintain the growth path charted out after World War II.

IV. LARGER AND MORE VOLATILE STOCK MARKETS

A. Medium of Exchange

According to Adam Smith, "when division of labor is thoroughly established, only a very small part of a man's want is the produce of his labor, and every man thus lives by exchanging, or becomes in some measure a merchant, and the society grows itself to be properly a commercial society (4)".

Money was necessary in a commercial society. Money facilitates trades by serving as a medium of exchange, a unit of account, and a storage of wealth. Metals were the preferred commodities used to coin money, since metals could be kept with little loss and because metals could be easily divided into parts. Iron was the common instrument of commerce used in ancient Sparta; copper was widely accepted in the Roman empire; silver was standard money throughout the Spanish empire; gold became widely accepted in the British empire and beyond until the middle of the 20th century (5).

After the gold, the world of commerce was based on fiat money such as the US dollars (23). The US dollars became widely accepted throughout the world following the end of World War II as the United States became a super power politically and economically. The US dollar's position as the world currency, the reserve currency, has enabled the United States to receive not only goods and services but also capital from abroad.

As William Poole, the former president of the Federal Reserve Bank of St. Louis, put it, in a 2004 comment about the US balance of payments, "the US case is, in some sense, unique. The central role of US financial markets - and of the dollar - in the world economy suggests that capital account surpluses are being driven by foreign demand for US assets... The United States has created for itself a comparative advantage in capital markets, and we should not be surprised that investors all over the world come to buy the product (24)".

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B. Financial Accounts

Indeed, by 2017, the persistence of the trade deficits accumulated in foreign debts amounted to $12 trillions or 60% of 2017 gross domestic product, since imports of goods and services must be paid either with reciprocal export of goods and services or with incurrence of liabilities. Some of those $12 trillions is the US public debt. According to the US Treasury Department, by the end of 2017, foreigners owned $6.2 trillions or 42% of $14.8 trillions US publicly held debt (25).

In a 2016 Congressional Research Service report, conducted as a result of concerns over the magnitude of US dollar denominated assets owned by foreigners, James Jackson put it: "The nation’s net international investment position indicates that the largest share of US assets owned by foreigners is held by private investors who acquired the assets for any number of reasons... who are prepared to gain or lose on their investments in the same way private US investors can gain or lose (26)".

Indeed, fluctuations of international transactions in financial accounts mirrored those of major stock indices. However, following the subprime mortgage crisis of 2008 (27), foreign investors have begun to shift their holdings of US dollar denominated assets into less risky ones. This suggests that foreign investors, whether private or official, were more than ready to limit or reduce the size of their holdings of US dollar denominated assets had the United States lost its comparative advantage in the capital markets.

Chart 10 includes the 3-year moving-averaged trajectories of expanded details of foreign acquisition of US private assets from 1962 to 2017. Portfolio investments, mainly investments in stock indices, were the major US private assets owned by foreigners until 2016 when direct investments, mainly equity and debt investments resulting in control or ownership of an enterprise, took over as the major foreign owned US assets; other investments, mainly trade credits and advances, were similar in magnitude as direct investments until 2008 when they dropped and remained insignificant since then (28).

Chart 11 includes the 3-year moving-averaged trajectories of expanded details of US acquisition of foreign private assets from 1962 to 2017. US acquisition of assets is half the size of US incurrence of liabilities reflecting the effect of the trade deficits. Foreign private assets owned by US residents are equally divided into portfolio investments, direct investments, and other investments. Portfolio and other investments were more volatile: they fell after 2008; portfolio investments had recovered to pre-2008 level briefly in 2012; other investments had never recovered and been divesting since.

C. Stock Markets

The US stock markets are analyzed here to further understand the effects of trades. Chart 12 includes the trajectories of the market values of the Standard & Poor's 500, the Dow Jones Industrial Average, the Nasdaq Composite, and the Russell 2000 index.

The Standard & Poor's 500, or the S&P 500, is an index for 500 large companies. The Dow Jones Industrial Average, or the Dow, is an index for 30 super-large companies. The Nasdaq Composite is an index for information technology companies. The Russell 2000 is an index for 2,000 small companies. These indices are considered to best represent over six thousand
companies owned by private investors in the United States. Thirty seven percent of these companies are listed on the New York Stock Exchange, the NYSE, and the rest on the National Association of Securities Dealers Exchange, the Nasdaq.

The NYSE and the Nasdaq are where investors daily buy and sell common stocks or shares of the company's ownership. As of May 2019, the market value of all companies traded on the NYSE is approximately $27.3 trillions and the market value of all companies traded on the Nasdaq is approximately $13 trillions (29).

The stock index values, as shown in Chart 12, are obtained by taking yearly samples of the 1-year moving-averaged daily values (30). The computation of 1-year moving averages of daily values, \( Y_{MA_{260}}(t) = \frac{Y(t) + Y(t-1) + \ldots + Y(t-259)}{260} \), \( t \) in days, assumes there are approximately 260 trading days per year. Yearly samples are taken on the same date of each year.

The stock indices experienced a dramatic rise in value beginning in late 1980. Then, as a consequence of terrorist attacks on September 11, 2001, they experienced a dramatic fall (31). The magnitude of the fall is greatest for the Nasdaq Composite index, about 60%, compared to the 30% fall for the S&P 500, the 15% fall for the Dow, and the 5% fall for the Russell 2000. After September 11, 2001, investors shifted funds from information technology companies into small and super-large companies.

The stock indices experienced another dramatic fall in value as a consequence of the subprime mortgage crisis of 2008. The magnitude of the fall is greatest for the S&P 500, about 40%, compared to the 30% fall for the Dow and the Russell 2000, and the 20% fall for Nasdaq Composite. The difference in magnitude of the fall between these two events suggests after September 11, 2011, not only that funds were shifted from technology companies into small and super-large companies but also that funds were shifted from technology into real estates, most likely because real estates are traditionally safer investments.

The stock indices had since the aftermaths of 2008 recovered and the recovery was dramatic. The Nasdaq Composite received the largest infusion of funds; its value rose nearly 300% over the last 10 years. The Dow was the second largest receiver of funds; its value rose 200% from 2008 to 2018. The S&P 500 and the Russell 2000 received a modest amount of funds; their value rose 40% to 60% during the last decade.

The precise estimates of investment risk and return are presented on the left side of Table 8 (30). The data for all stock indices is complete only from 1988 to 2018. The risk and return are measured by the annualized mean and standard deviation of the daily percentage change in value. The mean and standard deviation of the daily percentage change in value are obtained for each decade. These measures are then multiplied to the number of trading days during the year, approximately 260 days, to obtain the annualized mean and standard deviation.

In terms of return, the 1988-1998 decade was the most profitable, with the rate of return being around 15% for all indices, except for the Russell 2000 whose rate of return was 10%, and the 1998-2008 decade was the least profitable, with the rate of return being around 5% for all indices, except for the S&P 500 whose rate of return was 0%. There is little evidence that foreigners flocked to the US stock markets due to the extraordinary performance of returns.
In terms of risk, the 1998-2008 decade was the most volatile, with the standard deviation of return being around 300% for all indices, except for the Nasdaq Composite whose standard deviation of return was in excess of 400%, and the 1988-1998 decade was the least volatile, with the standard deviation of return being around 200% for all indices. There is little evidence that foreigners flocked to the US stock markets due to predictability of returns.

The precise estimates of investment trading liquidity are presented on the right side of Table 8. Trading liquidity is measured by daily trading volume. The daily trading volume rose over the decades, from millions of dollars during the 1988-1998 decade to billions of dollars during the most recent decade. It is likely that investors value the ease in which assets can be bought and sold in the US stock market.

In a 2008 paper published by the NBER, Kristin Forbes reported that, based on 2002-2006 Reports on Foreign Portfolio Holdings of US Securities, compiled by the US Treasury Department, the Federal Reserve Bank of New York, and the Board of Governors of the Federal Reserve System, foreigners invested in the US capital markets not because they offered high or predictable returns but because the US capital markets were highly liquid and efficient (32).

D. Regression Analyses of Stock Market Indices

The precise estimates of the differential impacts of personal consumption, government spending, private investment, and net export on investment returns are presented in Table 9. OLS regressions are used to obtain the estimates. The annual percentage change of the yearly samples of the 1-year moving-averaged daily values is the dependent variables and the annual percentage changes of personal consumption, government spending, private investment, and net export are the independent variables.

For the S&P 500, 1% increase in personal consumption leads to 0.014% decrease in return, and 1% increase in private investment leads to 0.008% increase in return. For the Dow, 1% increase in private investment leads to 0.011% increase in return. For the Russell 2000, 1% increase in private investment leads to 0.013% increase in return, and 1% increase in net export leads to 0.001% decrease in return. These are the only statistically significant estimates.

These results suggest that private investment plays a primary role, and personal consumption, and net export a secondary role in the return performance of US publicly held companies.

E. Summary

These analyses provide evidence that the US economy’s resilience lies not only in the labor markets but also in the capital markets. Even though capital inflows from abroad were massive the majority of investors were private individuals who were prepared to gain or lose on their investments the same way private US investors would gain or lose.

After the terrorist attack on September 11, 2001, funds were shifted from information technology into real estates. After the subprime mortgage crisis of 2008, funds were shifted from real estates back into information technology.

Because the US stock markets were unable to provide greater returns to investors -- the stock market returns had remained relatively stable despite the capital inflows from abroad -- foreign investors have begun to shift capitals from portfolio investment, investment in stocks and bonds, into direct investment, investments that result in control or ownership of enterprises.
V. DISCUSSIONS

Production in the United States, from 1947 to 1976, was on a balanced path, as shown on Chart 13, which includes the 3-year moving-averaged trajectories of capital-to-labor, capital-to-income, and labor-to-income ratios (33). During these 30 years, the relationship between income and factors of production was relatively stable. The capital-to-labor income ratio was relatively constant at 33%, the capital-to-income ratio at 17%, and the labor-to-income ratio at 50%.

The idea of balanced growth is well known. Robert Solow was among the pioneer economists who formulated them onto papers. In the two papers published in the mid-1950, Robert Solow demonstrated that substitution between capital and labor in the production process would lead an economy to a balanced path where capital and labor grow in equal proportions to maintain the economy in full employment (34), (35).

The relationship between income and factors of production in the United States changed after 1976. When the United States entered the trade deficit era, production relied less on labor. The capital-to-labor ratio rose from 33% to 39%: more income was devoted to capital than to labor -- 39 cents, instead of 33 cents, were devoted to capital for every dollar devoted to labor. The labor-to-income ratio fell from 50% to 45%: there was less income available for labor -- 45 cents, instead of 50 cents, were devoted to labor for every dollar of income. The capital-to-income ratio remained relatively constant, rising from 17% to 18%: there was slightly more income available for capital -- 18 cents, instead of 17 cents, were devoted to capital for every dollar of income.

These results confirm those found in the previous sections that wage or employment or both fell after 1976.

To further understand the effect of trades, in the context of balanced growth, actual income, capital, and labor are compared against estimated income, capital, and labor. Income is estimated assuming that it grows exponentially at an annual rate equal to the annual percentage change of income averaged over the entire time period from 1929 to 2017; labor is estimated assuming that it grows exponentially at an annual rate equal to the annual percentage change of labor averaged over the entire time period from 1929 to 2017; capital is estimated assuming that it grows as a fraction of income -- this fraction is the annual percentage change of capital averaged over the entire time period from 1929 to 2017. Employment and wage are also estimated using this method.

In Chart 14, actual income, capital, and labor are plotted against estimated income, capital, and labor from 1929 to 2017. In Chart 15, actual employment is plotted against estimated employment from 1929 to 2017. In Chart 16, actual wage is plotted against estimated wage from 1929 to 2017.

The estimated series are surprisingly close to the actual series until the turn of the millenium when they start to diverge. The estimated series cross over the actual series in late 1970s, then they cross below the actual series in early 2000s.

From late 1970s to early 2000s, the estimated series are slightly above the actual series. This is most likely because the trade deficits supported an increase in personal consumption while keeping private investment and government spending stable.
From 2001 to 2007, the estimated series merge with the actual series until they diverge significantly below the actual series starting in 2006. This is most likely because the inadequate growth of wage or employment or both, caused by the shift of employment and wage from some sectors into others, eventually led to the mortgage crisis of 2008.

VI. CONCLUSIONS

This study used the Bureau of Economic Analysis data from 1929 to 2017, and Yahoo Finance data from 1950 to 2017 to determine the effects of the persistent trade deficit and the accumulation of foreign debts on the US economy.

The main results of the study are (a) the trade deficit supported an increase in personal consumption without significantly affecting inflation, private investment, or government spending, (b) the infusion of funds from abroad succeeded in supporting employment or wage or both for some sectors but failed in supporting employment or wage or both for other sectors, (c) thus despite the positive effects of trades the US economy continued to decelerate and this deceleration was more rapid since 1976 when the United States entered the trade deficit era.

This study clarified the reasons behind the discontentment over trades despite the benefits of trades. The main lesson about trades is that there are winners and there are losers.

NOTES AND REFERENCES

(1) US trade policy actions, as of May 7, 2019, published on the White House website (whitehouse.gov): (a) January 23, 2017, the United States withdrew from the Trans-Pacific Partnership and began pursuing bilateral trade negotiations; (b) April 29, 2017, the United States announced the commitment to address trade agreement violations and abuses; (c) April 29, 2017, the United States established the Office of Trade and Manufacturing Policy; (d) June 29, 2017, the United States modified duty-free treatment under the Generalized System of Preferences for imports from designated beneficiary developing countries; (e) August 14, 2017, the United States announced the commitment to address violations of intellectual property rights and other unfair technology transfers; (f) March 8, 2018, the United States imposed a 10% ad valorem tariff on aluminum articles imported from most countries; (g) March 8, 2018, the United States imposed a 25% ad valorem tariffs on steel articles imported from all countries except Canada and Mexico; (h) March 22, 2018, the United States offered to continue discussion with Canada, Mexico, Australia, Argentine, South Korea, Brazil, the EU with respect to the imports of aluminum articles from these countries, and to exempt aluminum imports from these countries from the tariffs; (i) April 30, 2018, the United States announced the 10% ad valorem tariffs on aluminum articles imported from South Korea to begin on May 1, 2018, from Canada, Mexico, and the EU to begin on June 1, 2018; (j) May 31, 2018, the United States announced to implement a quota treatment on aluminum article imports from Argentina starting on January 1, 2018; (k) August 10, 2018, the United States announced to impose 50% ad valoren tariffs on steel articles imported from Turkey starting on August 13, 2018; 25% ad valorem tariffs on all countries except Argentina, Brazil, Canada, Mexico, South Korea, and the EU starting on March 13, 2018; 25% ad valorem tariffs on all countries except Argentina, Australia, Brazil, and South Korea starting on June 1, 2018; 25% ad valorem tariffs on all countries except Argentina, Australia, Brazil, South Korea, and Turkey starting on August 13, 2018.

(3) Yahoo Finance website (finance.yahoo.com).


(6) This paper does not focus on the Great Depression or World War II despite their importance. The Great Depression began in 1929 when economic activity drastically declined and ended in 1939 after President Franklin D. Roosevelt successfully obtained congressional passage of the New Deals programs. World War II was a war for world dominance between the Axis powers, whose main players were Germany, Spain, Italy, and Japan, and the Allied powers, whose main players were the United Kingdom, the Soviet Union, and the United States, even though the United States maintained neutrality until 1941. The war began in 1939 when the Axis powers invaded Poland as part of global expansion and ended in 1945 when the Axis powers surrendered. After the war the world was divided between the Western powers based on capitalist ideologies led by the United States and the Eastern powers based on communist ideologies led by the Soviet Union.

(7) The Marshall Plan was an American initiative aimed to help Western Europe to rebuild war-torn regions, remove trade barriers, modernize industry, improve prosperity, and prevent the spread of Communism. The operation of the Marshall Plan began in 1948 and ended in 1952.

(8) The Cold War was a war between the Western powers and the Eastern powers. The war did not involve active combats between the two super powers, the United States and the Soviet Union, but involved instead nuclear weapons build-up, strategic deployment of military forces, proxy wars, psychological wars, propaganda wars, trade wars, and technology wars. The war began in 1947 and ended in 1991 when the Soviet Union collapsed.


(10) Food and beverages include food and beverages purchased for off-premises consumption. Clothing includes clothing and footwear. Furnishings include durable household furnishings and equipment. Finance services include finance and insurance services. Transportation services include transportation, recreational food and accommodation services. Motor vehicles include motor vehicles and parts, recreational vehicles, and other durable goods.

(11) Intellectual property products include software, research and development, entertainment, literary, and artistic originals. Equipment include information processing, computers and peripheral, industrial, transportation, and other equipment.

(12) Full-time equivalent employees are employees on full-time schedules plus the number of employees on part-time schedules converted to a full-time basis.

(13) The agriculture sector include farms, forestry, fishing, and related activities.

(14) The manufacturing sector includes manufactures of lumber and basic timber products, furniture and finished lumber products; stone, clay, and glass products; iron and steel and their products; nonferrous metals and their products; machinery, electric and electronic equipment,
motor vehicles and other transportation equipment; food and kindred products; tobacco products; textile mill products; apparel and textile products; paper and allied products; printing and publishing products; chemicals and allied products; petroleum and coal products; rubber products; leather and leather products; and miscellaneous manufacturing products.

(15) The services sector includes business services; scientific and technical services; healthcare and social assistance services; educational services; accommodation services; arts, entertainment, and recreation services; membership and organization services; personal and private household services.

(16) The finance sector includes finance, insurance, and real estate services.

(17) The mining sector includes metal, anthracite, bituminous and other soft coal, crude petroleum and natural gas, and nonmetallic and quarrying.


(19) The civil and labor rights movements began in the late 1950s, led by many activists including Martin Luther King, Jr, and Cesar Chavez, and ended in the late 1960s when President Lyndon B. Johnson successfully obtained congressional passage of the Great Society programs, which included civil rights across race and sex, segregation abolishments, Medicare and Medicaid, federal aids to education, subsidies for the arts and humanities, environmental protection, and poverty reduction.

(20) The oil price crisis refers to the dramatic increase in oil prices during the 1970s due to the Arab oil embargo in 1973 and the outbreak of the Iranian Revolution in 1979. Saudi Arabia and Iran were the major petroleum exporting countries.


(23) Fiat money refers to paper, coin, and digital money backed not by any commodities but by the governing authorities.


(25) The $14.8 trillions of US publicly held debt are 76% of 2017 GDP; at this level, the US government ranked among the highest in indebtedness, according to the United States Department of the Treasury website (treasury.gov).


(27) The subprime mortgage crisis refers to the collapse of Lehman Brothers on September 15, 2008, due to the failure of investments in excessively risky and poorly underwritten mortgage backed securities. The collapse of Lehman Brothers spread to other financial institutions worldwide.
(28) Portfolio investments include investments in stock and bond funds. Direct investments include equity and debt investments that result in control or ownership of an enterprise. Other investments include currency and deposits, loans, insurance technical reserves, trade credit and advances, special drawing rights.

(29) The NYSE and NASDAQ websites (nyse.com and nasdaq.com).

(30) These statistics are not for investment purposes. They are intended only for comparative analyses of the stock markets between time periods.

(31) On September 11, 2001, a group of terrorists known as al-Qaeda hijacked four airliners and crashed them into the twin towers of the World Trade Center and the Pentagon.


(33) Capital is the amount of national income spent on private investment; labor is the amount of national income spent total wage and salary paid to full-time equivalent employees.


Chart 9

Percentage Share of Wage and Salary per Full-Time Equivalent Employee

Bureau of Economic Analysis Data

1. Agriculture
2. Mining
3. Construction
4. Manufacturing
5. Transportation
6. Wholesale
7. Retail
8. Finance
9. Services
10. Government

Data spans from 1931 to 2017.
Chart 10

United States Incurrence of Liabilities in Financial Account

- Direct Investment Liabilities (1)
- Portfolio Investment Liabilities (2)
- Other Investment Liabilities (3)

Bureau of Economic Analysis Data

Millions of Dollars

Graph showing the trends of Direct Investment Liabilities, Portfolio Investment Liabilities, and Other Investment Liabilities from 1962 to 2017.
Chart 14

Capital, Labor, Income

\[ Y_{\text{estimated}} = Y_{\text{initial}} \times \exp(g \times \text{time}); \]
\[ Y_{\text{initial}} = Y_{1929} = 104,556; \quad g = 0.0635 \]

\[ L_{\text{estimated}} = L_{\text{initial}} \times \exp(n \times \text{time}); \]
\[ L_{\text{initial}} = L_{1929} = 50,459; \quad n = 0.0624 \]

\[ K_{\text{estimated}} = 0.095 \times Y_{\text{estimated}} \]

Bureau of Economic Analysis Data

Chart 15

Full-Time Equivalent Employees

- Actual Number of Employees (1)
- Estimated Number of Employees (2)

\[ P_{\text{estimated}} = P_{\text{initial}} \times \exp(m \times \text{time}); \]
\[ P_{\text{initial}} = P_{1929} = 35,286; \quad m = 0.0162 \]
Chart 16

Wage and Salary per Full-Time Equivalent Employee

- Actual Wage (1)
- Estimated Wage (2)

\[ W_{\text{estimated}} = W_{\text{initial}} \times \exp(w \times \text{time}) \]

- \( W_{\text{initial}} = W_{1929} = 1,430 \)
- \( w = 0.0446 \)

Bureau of Economic Analysis Data