Levy Economics Institute of Bard College

Summary

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Contents

LETTER FROM THE PRESIDENT

Dear reader,

This issue of the *Summary* comes at an unprecedented time in most of our lives. Though the research summarized herein was produced prior to the COVID-19 crisis, the Institute has been working to provide timely assessments of its economic consequences, with findings suggesting that more can and should be done to ensure prosperity for all in the postcrisis period.

Under the State of the US and World Economies program, the first of two Strategic Analyses authored by myself and Research Scholars Michalis Nikiforos and Gennaro Zezza assesses the trends impacting the US economy's sectoral balances. This report demonstrates that the COVID-19 crisis did not unfold in the context of an otherwise healthy economy: overvalued asset markets and overleveraged corporate balance sheets made the US economy particularly vulnerable to a shock. Moreover, our analysis of the factors that could derail the pre-COVID-19 recovery make it clear that those structural weaknesses will still be afflicting the post-pandemic economy. Our Strategic Analysis for Greece identifies the necessary conditions for achieving the government's campaign promise of 4 percent GDP growth in 2020 and 2021 in the context of what was an already fragile and unstable recovery. In January we forecasted that even with an improvement in global conditions, Greece would still need private expenditure to surge to make more meaningful progress toward restoring household economic well-being to its precrisis levels. It is now clear that such improvement will not be forthcoming. In their policy brief, Yeva Nersisyan and Senior Scholar L. Randall Wray present an alternative approach to budgeting for the Green New Deal, much like the one outlined in John Maynard Keynes's 1940 pamphlet, *How to Pay for the War*. In contrast with traditional questions about the program's financial affordability, their approach asks whether there are sufficient real resources that can be marshalled for its implementation.

A working paper by George K. Zestos and Rachel N. Cooke addresses how Germany's social and cultural values have affected European integration, while leaving them better able to weather the asymmetric effects of the eurocrisis they played a part in creating. Nikiforos also contributes two working papers under this program. The first looks at four decades of demand shocks and their effect on output and productivity growth to ascertain if the recovery fits Alvin Hansen's definition of "secular stagnation"; the second is a response to a critique of his 2016 *Cambridge Journal of Economics* article on utilization in Kaleckian models of growth and distribution, in which he maintains that the average workweek of capital is the more appropriate measure for evaluating if capacity utilization is endogenous to demand.

Suggesting it is not surprising that today's economy is characterized by serious and frequent financial crises, in the first of three working papers presented under the Monetary Policy and Labor Markets program, Mario Tonveronachi examines two periods of financial instability associated with financial globalization in the modern era and how institutions meant to control financial fragility instead contributed to its development. Tanweer Akram and Anupam Das continue their investigation into the Keynesian nature of the relationship between short- and long-term interest rates, this time using data on daily yields of Canadian government securities, and Mikael Randrup Byrialsen and Hamid Raza present an empirical stock-flow model of Denmark using data for 1995–2016 to demonstrate the effects of real economic behavior on balance sheets and vice versa.

Christos Pierros also presents a stock-flow consistent model, extending the Levy Institute's model for Greece (LIMG) to assess the effectiveness of Greece's internal devaluation policy. In this paper, under the Employment Policy and Labor Markets program, he contributes to the literature by rendering prices endogenous to labor market institutions and accounting for different propensities to spend according income source. Research Associate Sameh Hallaq builds an empirical model to assess the wage differential between Palestinians in the West Bank and Gaza Strip based on refugee status, and Research Associate Jesus Felipe, Donna Faye Bajaro, Gemma Estrada, and John McCombie, argue that David Autor and Anna Salomons' 2017 and 2018 investigations into the impact of technical progress on employment growth are flawed because they present quasi-accounting identities, which definitionally relate employment to the product of labor productivity times output, and not true elasticities.

In the final working paper, under the Explorations in Theory and Empirical Analysis program, Research Scholar Fernando Rios-Avila, Liu Qiang, and Han Jiqin investigate the cause of China's low fertility rate in an attempt to disentangle the impacts of population control policies from the socioeconomic changes that accompany economic development.

I want to thank you for interest in the Institute's work during these uncertain times. I hope you will visit our website, levy.org, to stay connected as we move toward what I hope will be brighter days. Be well and, as always, I welcome your comments.

Dimitri B. Papadimitriou, *President*

Program: The State of the US and World Economies

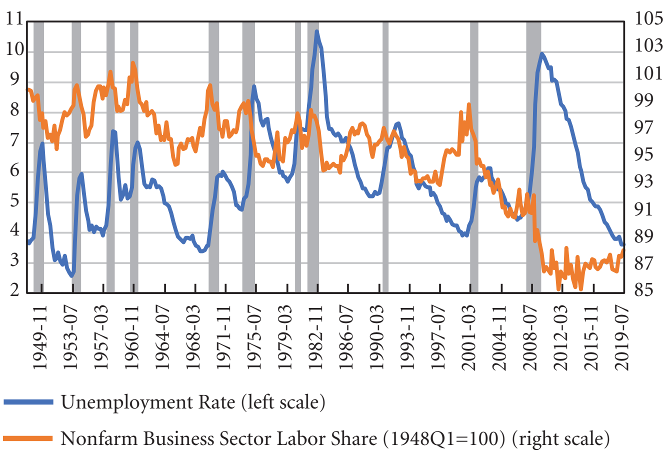
Prospects and Challenges for the US Economy: 2020 and Beyond

DIMITRI B. PAPADIMITRIOU, MICHALIS NIKIFOROS, and GENNARO ZEZZA

Strategic Analysis, January 2020

In this strategic analysis, Levy Institute President Dimitri B. Papadimitriou and Research Scholars Michalis Nikiforos and Gennaro Zezza present their analysis of the trends impacting the sectoral balances of the US economy. Writing in January 2020, they estimate that the recovery, which is both the weakest and the longest in US history, is likely to become even more anemic: they project baseline GDP growth will average 1.5 percent over the 2020–23 period (compared to the Congressional Budget Office's projection of 1.8 percent). In addition to a weakening baseline growth trend, the authors present evidence that the nonfinancial corporate sector is significantly overleveraged, creating considerable downside risks for the US economy.

Figure 1 **Unemployment Rate and the Wage Share**



Note: Shaded areas indicate US recessions.

Source: BLS

Despite the fact that the unemployment rate fell to its lowest level in half a century, there has been no appreciable impact on wage growth. In previous recoveries, a declining unemployment rate tended to coincide with a rise in labor's share of income—but this relationship appears to have broken down (Figure 1). Papadimitriou, Nikiforos, and Zezza point out that the jobs created during the ongoing recovery were mainly low-productivity, low-wage jobs.

The authors observe that in the first three quarters of 2019, US GDP growth (2.4 percent on an annual basis) was being driven largely by consumption (2 percentage points) and, to a lesser extent, government expenditure. They emphasize that this contribution of government expenditure to GDP growth is a notable development: it was only in 2019 that real government expenditure reached a higher level than it registered when the recovery began (2009Q2). By contrast with the positive contributions of consumption and public spending, private investment declined on an annual basis over the first three quarters of 2019. Net exports were likewise a drag on GDP growth.

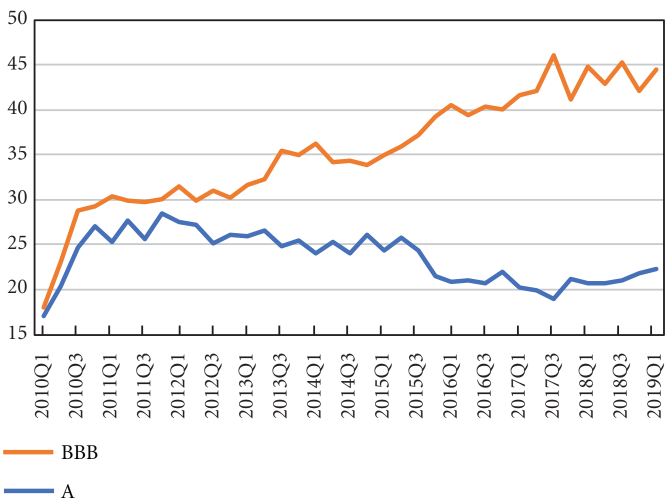
The authors identify three risk factors that could derail the (already weak) baseline path of economic growth: (1) flagging demand from the rest of the world, (2) the overvaluation of the stock market, and (3) fragility in the nonfinancial corporate sector.

Beyond the administration's unsuccessful tariff-centered trade policy—which, if anything, has caused disruptions for US corporations' supply chains and increased the cost of goods for US consumers—Papadimitriou, Nikiforos, and Zezza point to significant headwinds in the foreign sector: namely, the appreciation of the US dollar, which is at its highest level in the post–Bretton Woods era, and declining real GDP growth among US trading partners. They argue that the International Monetary Fund's (IMF) projections—that the growth rates of US trading partners will bounce back to what is assumed to be their "natural" rates (an assumption embedded in the IMF's model, as Papadimitriou, Nikiforos, and Zezza point out)—are unlikely to pan out. And the authors note that if trading partner growth rates do not rise—or worse, they deteriorate further—this would drag down US net exports and GDP growth.

The authors present evidence indicating that the US economy has become even more fragile, exhibited by what they describe as two "Minskyan processes": an overvaluation in asset markets and overstretched corporate balance sheets. They note that the Shiller price–earnings ratio is higher than it was in 1929 and is exceeded only by its late 1990s level, and that the ratio of market capitalization to GDP is the highest on record (dating back to the 1970s). The Federal Reserve's easy monetary policy and related changes in corporate governance strategies that prioritize shareholder value are part of the explanation, according to the authors. They warn that a significant reversion in the stock market's valuation is likely—particularly given the examples of 1929 and the late '90s (the last time valuations reached these levels)—with harmful ripple effects.

The nonfinancial corporate sector's liabilities are higher as a percentage of GDP than they were on the cusp of the crisis in 2007, the authors observe. Moreover, the corporate sector's gross leverage is higher than both its pre-2008 crisis and late 1990s levels. The share of issuers of corporate debt issuing the lowest investment-grade rated bonds (BBB) has increased, and the share of BBB-rated bonds in investment-grade corporate bond mutual fund portfolios has grown from 18 percent in 2010 to 45 percent at the time of writing (Figure 2). Finally, despite low interest rates, the number of firms in what Minsky called a "Ponzi" position (firms whose cash flows cannot cover the interest payments on their debt) has increased, and the share of "zombie" firms (firms with an interest coverage ratio that has been less than one for three consecutive years or longer) has likewise been growing and remains historically high.

Figure 2 **Average Percentage of Investment Grade Corporate Bond Mutual Fund Portfolios Invested in Bonds**



Source: BIS (2019)

The authors warn that these financial conditions—overvalued asset markets and overleveraged corporate balance sheets—make the US economy vulnerable to a shock that could trigger a cascade of falling asset prices and private sector deleveraging. They cite their previous research (Levy Institute strategic analyses from 2017 and 2018) showing that, even under conservative assumptions, a stock market correction combined with deleveraging would do severe damage to the economy.

www.levyinstitute.org/pubs/sa_jan_20.pdf

Greece: In Search of Investors

DIMITRI B. PAPADIMITRIOU, MICHALIS NIKIFOROS, and GENNARO ZEZZA

Strategic Analysis, January 2020

In this strategic analysis, Papadimitriou, Nikiforos, and Zezza analyze the foundations of the Greek economic recovery and report the results of two simulations through 2021: a "business as usual," or baseline, projection and a scenario identifying the necessary conditions for achieving the government's campaign promise of 4 percent GDP growth in 2020 and 2021.

The ongoing recovery of the Greek economy has featured modest growth and an improving but still-high unemployment rate (16.6 percent in October 2019). The country has seen a significant reduction in interest rates on government bonds, with Greek bond rates on par with those of Portugal at the time of writing (January 2020). However, Papadimitriou, Nikiforos, and Zezza emphasize that the recovery—which has been primarily export-led—is both unstable and fragile, given slow growth among Greece's trading partners and uncertainty stemming from geopolitical turbulence. Moreover, even with an improvement in global conditions, the authors explain that Greece needs private expenditure to surge in order to make more meaningful progress toward restoring household economic well-being to its precrisis levels.

Greece's internal devaluation strategy had some success for a period, in that wage reductions improved external competitiveness. Greece has reduced its real effective exchange rate since 2011, due to a decline in wages and, to a lesser extent, unit labor costs. However, although wages are still 21 percent below their peak (2010Q1) according to the ElStat wage index, the authors point out that wages have recovered somewhat since 2015. They conclude that, due to the recent upward trend in nominal wages, Greece should not expect further increases in competitiveness. Despite price competitiveness no longer showing improvement, exports of services—chiefly transport and tourism—have still been growing, particularly since 2016.

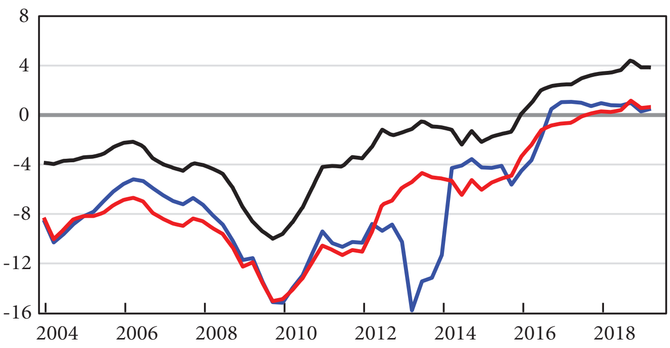
In order to fulfill its commitments to international creditors and secure financial support (from the European Central Bank, the European Stability Mechanism, and the IMF), Greece has maintained a primary budget surplus since 2016 (Figure 1). The authors point out that it was only in 2018, however, that gross government debt stabilized, at 196 percent of GDP according to their estimate (the authors include a technical note explaining this seeming discrepancy). The primary surplus was achieved by expenditure cuts—chiefly a reduction in the wages paid to public employees (due to both wage and employment cuts) and cuts to social benefits (including pensions)—and increases in indirect taxes and social contributions.

The primary budget surplus target was exceeded in 2018, giving the government some additional fiscal space in 2019. Nevertheless, given that the current account balance—albeit improving from its –15 percent of GDP trough in 2008—is still registering a deficit due to net income and transfer payments, the authors explain that it follows from the sectoral balances approach that the maintenance of a budget surplus is damaging the private sector's net financial position. This can be seen in part in the stagnation of private investment. The authors observe that investment has not come close to returning to its precrisis peak, and net investment has been negative since 2012, entailing a fall in the Greek economy's stock of capital (Figure 2). Reversing this trend, the authors stress, is critical to increasing the pace of the recovery.

After falling in tandem with GDP, Greek household consumption has been roughly stable since 2015, indicating that consumption has been rising relative to household income. The authors explain that a growing share of household spending in Greece is being financed not by borrowing (households have essentially been deleveraging since 2009), but by a reduction in the stock of household financial assets. Under the circumstances, the authors conclude, there is little that can be expected in terms of significant growth in household consumption in the near term.

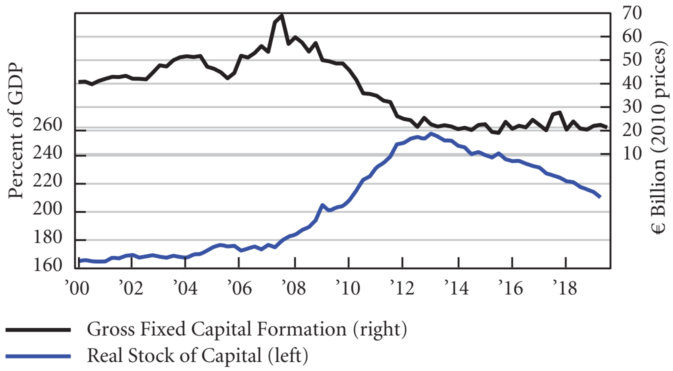
Using the Levy Institute's stock-flow macroeconomic model for Greece (LIMG), the authors project an average 2 percent baseline GDP growth rate for the period 2019–21. They point out that their projections diverge from the government's own beginning in 2020. Published in November 2019, the State Budget forecasts a 2.8 percent growth rate for 2020—driven by

Figure 1 **Greece: Government Surplus/Deficit (percent of GDP)**



Source: ElStat

Figure 2 **Greece: Investment and Capital**



Sources: ElStat; authors' calculations

much greater increases in private consumption and investment than the Levy Institute model projects. The current government in Greece, which took office in July 2019, campaigned on a promise to achieve a 4 percent GDP growth rate in 2020 and 2021. The authors point out that this would require even greater increases in private expenditure than those found in the government's official, already-unrealistic forecast. Keeping the government's campaign promise would require an almost 15 percent increase in private investment over the LIMG baseline scenario in 2020 and a further 17 percent increase in 2021. Given the slowing eurozone economies—with Germany's situation particularly worrisome—and uncertainty in neighboring countries, Papadimitriou, Nikiforos, and Zezza conclude that there is little reason to see how this campaign promise will be kept.
www.levyinstitute.org/pubs/gr_sa_1_20.pdf

Can We Afford the Green New Deal?

YEVA NERSISYAN and L. RANDALL WRAY
Public Policy Brief No. 148, January 2020

Yeva Nersisyan and Senior Scholar L. Randall Wray argue that there is a fundamental misconception behind objections to the Green New Deal that are based on its purported financial burden. The common approach to asking whether we can afford the Green New Deal, one that begins with summing all the proposed spending commitments, does not provide us with the most important information, in their view. According to Nersisyan and Wray, there are no meaningful *financial* barriers to taking public action—the US government, they argue, can make whatever payments are required. Furthermore, we should not simply assume that the proposed program spending must be offset by an equal amount of revenue increases and/or spending cuts.

This does not mean that there is no question of cost. Rather, Wray and Nersisyan argue for an alternative approach to budgeting. At the center of this alternative approach is the question of whether there are sufficient real resources—workers, plant and equipment, raw materials—that can be marshalled to implement the Green New Deal. Following John Maynard Keynes's *How to Pay for the War* (1940), their argument is that if the resource needs of this series of policies exceed the resources that can be made available, inflationary pressures will develop. It is only in such circumstances that tax increases would need to be considered. The authors also emphasize that taxes are not the only means of countering inflation. Moreover, in such a scenario the purpose of raising taxes would not be to raise revenue, but to effectively curtail aggregate demand. This policy brief is based on the findings presented in Levy Institute Working Paper No. 931 ("How to Pay for the Green New Deal").

In the policy brief, Nersisyan and Wray provide estimates of the resources required and available for implementation of the Green New Deal's major elements, including the net resource impacts of transitioning fully to renewable and efficient energy sources; the job guarantee; a single-payer healthcare system along the lines of Medicare-for-All; and the curtailing of "forever wars." Their analysis takes into account that some resources would be released or shifted from one use to another (investment of resources in exploration for and generation of nonrenewable energy would decline, for instance), while in some instances resources would be created by newly implemented programs (such as the greening projects carried out by participants in the job guarantee program). Given that conventional estimates place the biggest price tag on the Medicare-for-All portion of the Green New Deal, it is notable that the authors find it would lead to net resource savings. Although the conventional approach focuses on the increase in public spending due to Medicare-for-All, Wray and Nersisyan observe that in their framework we must also take into account the (greater) private spending reductions that could accompany a shift to single-payer healthcare. "In general," they write, "it makes no difference *in terms of inflation* whether the dollar spent to hire resources comes from the government or from the private sector."

Overall, they find that the net increase in resource use due to the Green New Deal's implementation would amount to roughly 1.3 percent of GDP on an annual basis. Even if not offset by tax increases or other measures, this may not cause significant inflation, they argue: there is still substantial unused capacity in the US economy, and potential growth can itself be raised (just as potential output has been degraded by running below capacity for so long, so potential output can be raised by running the economy closer to full employment). In case inflation does pose a problem, Nersisyan and Wray recommend a policy of deferred compensation designed to

reduce consumption. A temporary employee-side payroll tax surcharge averaging 4.6 percent would be paired with higher Social Security benefits to be disbursed when the inflationary danger has passed. With the payroll tax surcharge included, they calculate the Green New Deal would roughly net out to zero in terms of the overall increase in resource use.
www.levyinstitute.org/pubs/ppb_148.pdf

Challenges for the EU as Germany Approaches Recession

GEORGE K. ZESTOS and RACHEL N. COOKE
Working Paper No. 948, February 2020

Outlining the recent macroeconomic and geopolitical developments in the eurozone, George K. Zestos and Rachel N. Cooke, Christopher Newport University, assert that Germany's ethnocentric and minimalist approach to integration is at least partially responsible for the European Union's (EU) current problems.

The authors trace the history of Germany's strong postwar growth, crediting their social market economy for promoting income equality and social inclusion. However, this system was abandoned to maintain international competitiveness following contractions from shocks such as the 1970s oil crises and reunification in the early 1990s. The emergence of the Hartz I–IV Reforms, which reduced workers benefits, contributed to reversing the gains made during the 1950s and '60s, leading to the rise of the Christian Democratic Union party. Under Angela Merkel's leadership, Germany turned away from the EU and toward national interests, promising instead to protect German taxpayers by preventing the transfer of northern EU funds to southern EU treasuries. Zestos and Cooke find this new outlook manifested in the German response to the global financial crisis, when austerity measures in distressed eurozone countries pushed the EU into a sovereign debt crisis. They contend that, in a repeat of the mistakes made following the collapse of the Berlin Wall, Germany's persistence in protecting its taxpayers deepened the contagion.

As a result of the benefits received by being part of the EU, Zestos and Cooke maintain that Germany was better able to weather the asymmetric effects of the eurocrisis it played a part in creating. The authors suggest that the relative safety of its bonds led to capital inflows from southern member states and the chronic and unsustainable current account surpluses it generated had indeed created a transfer union, but flows were moving in the wrong direction. With no automatic stabilizers to reverse the flows, the European Central Bank adopted prolonged expansionary monetary policy that drove interest rates below zero, saving the euro, but hurting German savers who placed the blame for the crisis squarely on the Greek government.

Underlying the policies adopted in response to the eurocrisis was the German economic theory of ordoliberalism, which promotes financial discipline and low inflation, and is responsible for the constitutionally enshrined "debt brake," that Zestos and Cooke suggest has prevented policymakers from responding to new economic realities. The reduced investment in infrastructure, education, and research in the name of balanced budgets has been met with criticism, though German citizens consider austerity policies a point of national pride, and calls to remove the debt brake have gone unheeded.

Also facing criticism is the outsized German export sector, supported by German savings and lending, that contributes to the global trade imbalance and, in conjunction with the austerity imposed on the southern European states, has exacerbated the recession in the eurozone. The authors explain that, given the fiscal space available in Germany and its potential for positive spillover effects across the eurozone, the pain experienced in the peripheral countries as a result of the eurocrisis could have been avoided with German cooperation; however, they suggest that German voters continue to reject pro-European policies in favor of nationalistic ones that retain spending limits. Progressive policies that do pass, such as those taken to combat climate change or improve infrastructure, fall short of providing the needed stimulus, and monetary policy undertaken by the ECB is reaching the limits of its effectiveness. Zestos and Cooke advocate for the completion of the European Monetary Union's fiscal and banking union. While Germany, as the Union's most influential economy, has resisted this move in the name of protecting its taxpayers, the authors indicate that any short-term gains that may be generated make them vulnerable to future financial and economic crises. Without a complete union, the EU is also less able to exert geopolitical influence, leaving Turkey and Russia to dictate outcomes in the Middle East.

Though the authors are heartened by recent elections and administrative appointments in the EU, they underscore the need for Germany to realize the benefits it receives as an EU member and do its part to facilitate prosperity for all. Failing this, they recommend a “two-speed” Europe, to reduce frictions and free southern member states from the restraints imposed by the north.
www.levyinstitute.org/pubs/wp_948.pdf

Demand, Distribution, Productivity, Structural Change, and (Secular?) Stagnation

MICHALIS NIKIFOROS
Working Paper No. 945, January 2020

Against a background of the slowest postwar recovery in US history, Research Scholar Michalis Nikiforos looks at what Alvin Hansen called “secular stagnation,” or the tendency for developed capitalist economies’ real GDP growth rate to decrease and remain low, to uncover its underlying causes. Tracing demand shocks in the US between 1980 and 2010—such as a decrease in net exports, unprecedented fiscal conservatism, and increasing inequality—Nikiforos outlines their effect on output and productivity growth to determine if today’s stagnation is indeed secular.

Among the ideas put forward to explain the economic conditions of the early 20th century, Hansen proposed a demand-based theory, where investment opportunities were limited because of slowdowns in market expansion and population growth, as well as by the development of less capital-intensive technologies. However, the postwar period’s robust growth diminished the interest in stagnation’s origins until the current weak recovery brought it back to the forefront. One recent contribution, Robert Gordon’s *The Rise and Fall of American Growth*, argues that the US experienced synchronous (but coincidental) technological advancement in the century after the Civil War that revolutionized production and enabled rapid productivity growth, leading to improvements in living standards and life expectancy, while the past 50 years have been marked by slower growth, as technological change became concentrated mainly in the sectors that lack the revolutionary effects of the previous period. Contending this is in line with the neoclassical steady state growth model, where changes in growth rates as well as the aforementioned technological advancements are the result of exogenous forces, Nikiforos takes issues with Gordon’s argument, noting that technical change’s endogeneity has been discussed as far back as Adam Smith and is due to some basic characteristics of capitalist accumulation where technical change increases the market’s size, making space for more technical change. He therefore suggests that looking into the cause of the slowdown in technical change in conjunction with the changes in demand and distribution can help in ascertaining the origins of output’s slowing growth.

Nikiforos begins by investigating the financial balances of the economy’s three major institutional sectors (private, government, and foreign), where basic accounting principles imply a deficit in one sector requires a surplus in at least one other. He finds the growth rate slowdown of the last four decades coincides with an increase in the current account deficit that is matched by a trade deficit of a similar magnitude, creating a drag on aggregate demand and slowing growth. This prolonged trade deficit has abetted the demise of American manufacturing, generating important political repercussions, such as a turn toward a more conservative fiscal stance over the period. With the post-2009 recovery registering low growth in real government spending and deficiencies in net exports, the private sector became a net borrower, and growth became dependent on their credit-financed demand. This accumulation of financial liabilities created an unsustainable process that persisted until the eve of the Great Recession, when the private sector increased its savings rate, triggering a slowdown and crisis.

Compounding these balance sheet issues is rising inequality. Real wages for the bottom 90 percent grew four times slower since the 1970s than they did in the 25 years prior, representing a redistribution of income to households in the top 10 percent, where their lower propensity to consume led to a decrease in aggregate demand. Though this decrease is not as dramatic as it could have been if consumption was not supported by increased borrowing on behalf of the bottom 90 percent of households, Nikiforos asserts that these structural characteristics create a situation where the US economy faces a dilemma between stagnation or financial instability.

Briefly touching on other issues contributing to the US economy’s stagnation, Nikiforos explains that its increasingly monopolistic and oligopolistic structure has increased firms' profits and savings without a concomitant increase in demand, resulting in excess capacity. The economy's financialization has decoupled cash flows from accumulation, making it more attractive for firms to channel their profits into financial markets, and debt accumulation has been used for share buybacks rather than real investment. Nikiforos argues that these unsustainable processes, as well as the overvalued stock market and the rise of Ponzi firms, are detrimental to economic growth. However, at the same time, there is nothing secular about the resulting stagnation.

www.levyinstitute.org/pubs/wp_945.pdf

On the "Utilization Controversy": A Rejoinder and Some Comments

MICHALIS NIKIFOROS

Working Paper No. 940, November 2019

Responding to Santiago Gahn and Alejandro González's critique (*Cambridge Journal of Economics*, 2019) of his 2016 article, "On the 'Utilisation Controversy': A Theoretical and Empirical Discussion of the Kaleckian Model of Growth and Distribution" (*Cambridge Journal of Economics*), Research Scholar Michalis Nikiforos points out several weaknesses in their argument while maintaining his original hypothesis: that given its positive and nonstationary trends over the long run, the average work week (AWW) of capital is a more appropriate measure than the Federal Reserve Board's (FRB) data for evaluating whether capacity utilization is endogenous to demand.

Nikiforos begins with a summary of Gahn and González's argument, noting that it centers on their analysis of FRB utilization measures and the AWW using unit root tests, where they find that both the AWW measure and the difference between FRB and AWW measures are stationary. Refuting their argument, Nikiforos makes some general observations regarding their premise. Consistent with the literature, he asserts that the way the FRB data are constructed constitutes a logical fallacy, making them inappropriate for measuring long-run variations in utilization. He also notes that Gahn and González only reviewed three of his four AWW estimates, ignoring the most seminal of the estimation methods, which shows there have been significant increases in the amount of time capital is being utilized.

Addressing Gahn and González's critique directly, Nikiforos comments on their neglect of best practices—which employ modified information criteria or similar methods for lag length selection in unit root tests—in favor of conventional model selection criteria, such as the Akaike Information Criterion (AIC) or the Schwartz Information Criterion (SIC). Nikiforos suggests that since unit roots are sensitive to the number of lags, Gahn and González's results are misleading, and proper lag length selection methods that are appropriate for small sample sizes, such as a Ng and Perron's modified AIC, would alter the result dramatically. Running several unit root tests with different lag selection criteria on three series of AWW data, Nikiforos finds that all but one (the SIC) point to the existence of a unit root; however, Gahn and González choose to only report on this outlier in their critique. With reference to one particular AWW data series (Beaulieu and Mattey), he notes that the findings of nonstationarity in some industries and not in others are important because if utilization were stationary, as Gahn and González purport, it would be the case across industries. Because of the heterogeneity observed across various industries' adjustment margins, Nikiforos concludes that panel root tests used by Gahn and González to reject the unit root null hypothesis are inappropriate.

Regarding the other two AWW data series (Orr and Shapiro), Nikiforos considers their noise and volatility at higher frequencies, which is not present in the FRB data, and attempts to eliminate this. Applying the unit root test to the newly smoothed data series, he finds the Orr data fails to reject the unit root, while the Shapiro data appears stationary. Delving deeper into Shapiro's data, he notes a change in the construction methodology in the series (addressed in a later publication by Shapiro) produces a major dip in one quarter that is not supported by the underlying economic conditions of the time. Compensating for this change in his "adjusted" Shapiro series, Nikiforos finds it tracks Orr's results more closely and does not represent a real shift in the AWW. Applying unit root tests to his adjusted Shapiro series, as well as to Shapiro's amended series, he finds overwhelming support for the existence of a unit root.

In response to Gahn and González's assertion that the FRB and AWW measures are essentially the same and any difference between them is a measurement error, Nikiforos argues that because the measures are in different units, Gahn and

González's calculations do not represent a meaningful variable. He illustrates the issue by indexing the FRB utilization measure and the various AWW series, then subtracting the FRB indices from the AWW measures and running unit root tests, concluding once again that, in contrast to Gahn and González's work, there is clear support for the unit root hypothesis.
www.levyinstitute.org/pubs/wp_940.pdf

Program: Monetary Policy and Financial Structure

Ages of Financial Instability

MARIO TONVERONACHI
Working Paper No. 947, February 2020

Mario Tonveronachi, University of Siena, traces two periods of instability associated with financial globalization in the modern era. Beginning in the middle of the nineteenth century, he details the conditions that culminated in the 1929 crisis, as well as changes since the oil shocks of the 1970s that led to the exploitation of the weaknesses in the institutions established in the interregnum—institutions meant to control national and international financial fragility—recreating and magnifying the causes responsible for the first era of financial instability.

Tonveronachi's theoretical narrative, based on Minsky's approach to financial fragility, revisits the early explanations of instability offered by Marshall and Hawtrey (based on the inherent instability of credit), and the later developments by Keynes and Irving Fisher. The operation of the gold standard in a substantially unregulated financial environment, vis-à-vis the growing role of bank credit, was, according to these authors, at the heart of the financial cycles—with predominant monetary features—that were increasingly characterizing the first period of financial instability. The private sector's inherent tendency to create credit booms encountered the constraints posed by the gold standard and obliged central banks to defend the external parity, at the price of producing financial and economic crises and deflation. Tonveronachi explains how the debt legacy of WWI and the difficulties of reestablishing a functioning international gold standard, while private speculative finance was left free to gain further space, finally led to the 1929 crisis, bringing with it the end of the first period of globalization. The crisis enhanced theoretical and political reactions characterized by a statist approach to policies and institutions, aimed at an international order compatible with national autonomy. The New Deal, the Glass-Steagall Act, and the proposals finally leading to the Bretton Woods agreement are analyzed under this perspective.

These developments explain the second thread of Tonveronachi's analysis, which is based on changes in the balance of the public-private partnership. Because a capitalist system must necessarily rely on decentralized private credit creation that competes with the state's monetary sovereignty and whose results often conflict with public goals, Tonveronachi explains that a sort of public-private partnership ensues where private credit creation is licensed under conditions directed at disciplining the private sector, mainly through monetary policy and financial regulation and supervision. As a corollary, the state becomes guarantor of last resort of the financial sector's viability, with the latter's eventual negative externalities converted into public losses. The nature and strength of these conditions show, together with a more general approach to public intervention, how the balance in that partnership may be skewed toward laissez-faire or statism, and calls attention to whether different balances entail different weights on public finance.

Tonveronachi explains how the post-1929 statist reaction against laissez-faire won the battle against financial vested interests, but not the war. The Glass-Steagall Act, explicitly devised to contain stopgap measures that were to be later revised and completed, possessed inherent weaknesses that were not mended and later permitted laissez-faire-oriented supervisors to allow financial innovations, finally leading to its irrelevance and demise. Under pressure from large US banks, the final Bretton Woods agreement had to abandon the obligation for all countries to cooperate in controlling international private capital flows, thus leaving open the door for a new wave of financial globalization. The theoretical statist approach, too, was soon debilitated by internal developments and a vibrant laissez-faire renaissance, cultivated by private vested interests.

According to Tonveronachi, the end of the Bretton Woods regime and the management of the two oil shocks in the 1970s mark the end of international cooperation sensitive to national

autonomy in favor of an aggressive laissez-faire approach dominated by the interests and rules dictated by large international players, ushering in the second age of financialization and globalization: an age of increasing domestic and international financial complexity and fragility, well explained by Minsky's analysis of "money-manager capitalism." Following the analyses developed by the aforementioned authors, Tonveronachi concludes, it is not surprising that the current era has been characterized by increasing frequency and seriousness of financial crises in both the periphery and the center of the international system, as well as an increase in the difficulty and social costs encountered by the state in complying with its obligation as guarantor of last resort in a laissez-faire regime.
www.levyinstitute.org/pubs/wp_947.pdf

The Empirics of Canadian Government Securities Yields

TANWEER AKRAM and ANUPAM DAS
Working Paper No. 944, January 2020

In the latest offering into their investigation of the short-term interest rate's impact on the long-term rate, Tanweer Akram, Thrivent, and Anupam Das, Mount Royal University, model the relationship between short- and long-term interest rates in Canada. Presenting their argument from the Keynesian perspective, where the central bank's action in setting short-term interest rates has a decisive influence on the long-term rate, Akram and Das undertake an empirical analysis of Canadian government security yields using daily data.

Suggesting that an understanding of the empirics of government security yields can be useful for strategic policymaking and investment decisions, the authors present the two main schools of thought on the dynamics of bond yields. While the neoclassical view holds that government bond yields are the outcome of demand for and supply of loanable funds, the Keynesian argument posits that in countries with monetary sovereignty—and in correlation with fundamental macroeconomic factors, technical characteristics of financial markets, and investor behavior—long-term interest rates are influenced by the central bank's actions. To test whether the Keynesian perspective is valid, Akram and Das employ daily data on Canadian government security yields, while controlling for several important factors, such as the influence of the domestic equity market, oil prices, and the Canadian dollar's exchange rate. They note that their use of daily data constitutes a near real-time assessment of long-term security yields, and therefore can provide important information for investors, financial analysts, and policymakers.

To visualize the trends in interest rates and other variables of interest, Akram and Das plot the evolution of long-term Canadian government security yields, illustrating that since their peak in the early 1990s, they have declined progressively partly due to a decline in observed inflation and inflation expectations. They next plot the central bank's policy rate next to the short-term interest rate, as measured by the three-month Treasury bill, finding they generally move in tandem. Scatterplots of long-term yields for Canadian government securities of various tenors versus the yield of the three-month Treasury bill reveal a strong positive correlation between the two that declines as the maturity tenor increases.

Analyzing their data for unit roots, Akram and Das employ augmented Dickey-Fuller and Phillips-Perron tests to identify whether their variables are stationary, finding them to be stationary at levels, but not in their first differences. They next test for cointegration with the standard Johansen technique, which provides substantial evidence of a long-run cointegrating relationship between government bond yields, short-term interest rates, and their control variables (with some exceptions for bonds of longer maturity tenors). Granger causality tests illustrate the short-run dynamics between changes in the short-term interest rate, Canadian government securities yields, and the control variables, with results indicating that in the short run, the daily changes in the three-month Treasury bill's yields Granger causes changes in the yields of long-term bonds with a maturity tenor of seven years or fewer, while long-term bond yields consistently Granger cause the short-term interest rate, suggesting a bidirectional causality. They also find evidence of bidirectional Granger causality between the change in bond yields and the change in the log of the equity price index, but note that findings related to Granger causalities merely establish statistical evidence of temporal precedence while not definitively establishing their origin.

Akram and Das conclude that, in line with Keynes's conjecture, their findings demonstrate that short- and long-term interest rates are cointegrated in a wide range of models, and

that this has implications for economic theory and public policy, as well as for the ongoing macroeconomic debates around monetary policy and central bank operations. They suggest that supplementing their findings with additional results that incorporate quarterly macroeconomic data, especially concerning government debt and fiscal deficit ratios as a share of national income, would be useful for decisions concerning fiscal policy, as well as for the Treasury's management of public debt.
www.levyinstitute.org/pubs/wp_944.pdf

An Empirical Stock-Flow Consistent Macroeconomic Model for Denmark

MIKAEL RANDRUP BYRIALSEN and HAMID RAZA
Working Paper No. 942, January 2020

Asserting that understanding the interdependencies between the economy's real and financial sides is critical for formulating effective macroeconomic policy, Mikael Randrup Byrialsen and Hamid Raza build a stock-flow consistent (SFC) model for Denmark to demonstrate the structural linkages through which the two interact in a small, open economy. Their model, based on Danish data for 1995–2016, estimates a baseline for analyzing the effects of two shocks (fiscal and interest rate) to ascertain the transmission mechanisms through which real economic behavior affects balance sheets while capturing the feedback effects from balance sheets to the real economy.

Byrialsen and Raza discuss Demark's move toward developing a new forward-looking hybrid macroeconomic model that can analyze short-run policy effects, as well as create medium- and long-term fiscal projections, but also indicate that this model is not without criticism given its lack of attention to the financial sector. Influenced by the recent contributions to the Post-Keynesian SFC literature, the authors suggest that the SFC framework—where the real and financial sectors are linked through standard accounting principles and the dynamics of the data are explained through behavioral equations—is better than mainstream models at detecting balance sheet instabilities and their subsequent adverse effects.

Before explaining the structure, the authors outline the steps involved in the model's development, particularly those taken to overcome the limitations in the data. Keeping in mind their initial research question (the effect of household gross debt), they make some simplifying assumptions, such as reducing the number of financial assets by aggregating them into subcategories. To take account of the stocks in the economy, they build a balance sheet matrix consisting of three financial assets, again with some simplifying assumptions, noting that both sides of the balance sheets of all the sectors have expanded over the period of interest, particularly in the years leading up to the global financial crisis. Byrialsen and Raza then build a transaction flow matrix to explain the economic transactions between the sectors, focusing on the flows most relevant to their research question. On the real side, they find that, as expected, wages are the most important source of income for households, while taxes and consumption account for the majority of the expenditures; on the financial side, outflows for asset purchases go to pensions, interest-bearing stocks, and equities, while inflows for borrowing include interest-bearing loans. Flows for the other sectors are in line with expectations.

Turning to the model's structure, the authors present the equations and accounting identities used in building the model for all sectors under consideration. They note issues particular to Denmark that may affect their model, such as tax policies that incentivize households to borrow to make financial asset purchases or the effect of welfare-state policies on government spending. Preparing the data for their model, they follow an autoregressive distributive lag technique, testing for unit roots and structural breaks before estimating the regressing equations. Given the small sample size, they estimate their equations with two lags. Byrialsen and Raza follow a general-to-specific methodology and fit a parsimonious model, noting that their choice of variables is purely theoretical and the number of variables is limited by data availability. Comparing their simulation results to the data, they find that, to some extent, the estimated behavioral equations are able to explain the data's dynamics.

In simulating their baseline scenarios, Byrialsen and Raza find their outcomes lower than those in other studies, but still plausible given the exigencies of the Danish economy. Analyzing the effects of their two shocks, they look first at a fiscal shock in the form of a 1 percentage point increase in real public consumption, which produces a multiplier effect of 0.3 percent. This shock increases domestic demand and adversely affects the current account balance, while increasing public debt and improving financial net wealth in the production and foreign sectors. Their second shock—a 1 percentage point increase in the interest rate on all interest-bearing stocks in response to an increase in foreign interest rates—is contractionary in nature, driven by a fall in both consumption and investment.

The authors conclude that while the results need to be interpreted with great caution, their SFC model facilitates meaningful analysis of the accumulation of financial assets and liabilities.

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Program: Employment Policy and Labor Markets

A Labor Market–Augmented Empirical Stock-Flow Consistent Model Applied to the Greek Economy

CHRISTOS PIERROS

Working Paper No. 949, February 2020

Christos Pierros, Labor Institute of Athens (INE-GSEE) and University of Athens, extends the Levy Institute's stock-flow consistent (SFC) model for Greece (LIMG) to assess the effectiveness of Greece's internal devaluation policy. His new model, the labor market–augmented SFC (LMSFC), contributes to the literature by accounting for different propensities to spend according to each source of income and renders prices endogenous to labor market institutions, such as the minimum wage and collective bargaining coverage ratio, making it feasible to examine the impact of internal devaluation on economy activity both in terms of cost competitiveness and domestic demand.

In an effort to foster export-led growth, the economic adjustment programs (EAPs) implemented in Greece and other eurozone countries called for labor market deregulation to drive down domestic prices and enhance cost competitiveness. Pierros asserts that this redistribution of national income at labor's expense did not consider the economic realities of the Greek economy, namely that they face a significant structural competitiveness deficit and their institutional regime is likely to be debt-led. Considering these factors, he suggests the EAP policies were inappropriate and triggered private sector insolvency. Greece chose to reduce unit labor costs (ULC) by reducing labor costs per employee rather than increasing productivity, a path that, in addition to increasing unemployment, ignores the impact of reduced wages on profit margins and the effects of internal depreciation on domestic demand, while rending the relationship between prices and exports fragmented.

Pierros contends that focusing on long-term production costs overlooked short-term realities that ultimately determine the economy's growth path. In 2012, in the first of two waves of EAPs, Greece reduced collective bargaining coverage by nearly 70 percentage points, indirectly promoting wage adjustments and making decisive changes to the laws around industrial relations; the second wave reduced the minimum wage by 22 percent and facilitated workforce reductions. These two measures had the dramatic effect of reducing compensation per employee by 16 percent between 2009 and 2016 without a significant effect on net exports.

Pierros builds his model employing quarterly data from 1999Q1–2016Q4 from the sectoral accounts of Eurostat and the Bank of Greece, as well as other official sources, with the integration of households, firms, and banks in the private sector allowing for a close approximation of the flows between the private, public, and external sectors. His empirical results imply that, since 2012, household consumption exceeds disposable income and that in the corporate sector savings exceed investment activity, creating an unsustainable growth path, with the internal devaluation aggravating these conditions. Pierros also finds that, rather than an issue of cost competitiveness, it is significant structural deficits in the domestic productive sector that prevent the attainment of export-led growth in Greece.

Simulating the effects of a set of policy scenarios—specifically the introduction of a minimum wage increase and a decrease in the share of partial/temporary employment (as a proxy for collective bargaining coverage)—Pierros introduces the changes in the model's out-of-sample projections and compares them to the baseline. Concerning the minimum wage increase, he compares the effects of a one-off increase of 10 percent in 2019Q1 versus a gradual increase of 2.5 percent each quarter of the same year, finding a positive, if moderate, impact on GDP and a decrease in unemployment in both scenarios, with the latter having a slightly greater effect on both, though he cautions the results may follow a different path if the wage increase is used for debt service instead of consumption. Pierros finds these results indicate the Greek economy is not profit-led, given that the redistribution of national income in favor of labor has a positive impact on aggregate demand. The reduction of part-time workers in total employment has a stronger overall impact on both GDP and unemployment.

Pierros concludes that internal devaluation is not the right policy for restoring the Greek economy, given its particular institutional and behavioral characteristics. He recommends a reregulation of the labor market to restore demand in the short run, accompanied by public investment in infrastructure, a redesign of fiscal policy, and restructuring of debt to improve Greece's ability to generate a trade surplus in the medium and long run.

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The Relationship between Technical Progress and Employment: A Comment on Autor and Salomons

JESUS FELIPE, DONNA FAYE BAJARO, GEMMA ESTRADA, and JOHN MCCOMBIE

Working Paper No. 946, February 2020

Analyzing the results of two studies by David Autor and Anna Salomons (2017, 2018), Research Associate Jesus Felipe, Donna Faye Bajaro, and Gemma Estrada, Asian Development Bank, and John McCombie, University of Cambridge, argue that Autor and Salomons' investigation into the impact of technical progress on employment growth is flawed and their work is ultimately unable to answer the question it seeks to address.

The authors describe Autor and Salomons (2017) as an attempt to statistically test the "Luddite fallacy"—or the hypothesis that faster technical change reduces employment growth. Using aggregate and sectoral data for advanced economies, Autor and Salomons regress employment growth on labor productivity growth with some controls and provide what the authors note is, at first sight, compelling evidence that technical progress at the aggregate level (measured by the growth rate of labor productivity) is employment-augmenting. In their second paper, Autor and Salomons (2018), they instead measure technical progress using both total factor productivity (TFP) growth and patent data, considering other outcome variables in addition to employment growth, with findings suggesting that automation displaces employment and reduces the labor share in own industries, though employment losses are reversed by some indirect gains and induced increases in aggregate demand. Felipe et al. (2020) argue that the proxies for technical change in both studies are not independent measures (i.e., the value of the rate of technical change is not dependent on a particular theory or its underlying assumptions), posing problems for the procedures used and conclusions drawn.

Autor and Salomons (2017) regresses employment growth on productivity growth and the estimated coefficient as an elasticity. However, Felipe et al. contend what is presented are not true elasticities but are instead the coefficients of a *quasi-accounting identity* that does not convey any relevant information: this identity is the one that definitionally relates employment to the product of labor productivity times output. Therefore, the authors argue that adding output growth to Autor and Salomons' static regression poses a Catch-22 in that the regression is incomplete without output growth, but adding it will merely result in the tautological definition of employment growth, which offers no new information because it will always be definitionally true. For this reason, the authors instead define Autor and Salomons' regression as a quasi-accounting identity, where employment and productivity growth are related through the identity, and output's growth rate is an "omitted," but known, variable. Additionally, the authors suggest that the other control variables Autor and Salomons add (such as population growth and lagged values of productivity growth) do not improve their results.

Autor and Salomons (2018) focuses on the direct and indirect factors behind technical progress's role in displacing labor. Instead of labor productivity growth, for this study they choose TFP growth as their measure of technical progress, with many caveats acknowledging the appropriateness of this choice. Though Autor and Salomons make several refinements from their earlier paper, Felipe et al. argue that primal TFP (derived from a production function) is an inappropriate measure of technical progress. They also show that Autor and Salomons' (2018) key regressions suffer from an identity problem, because primal TFP growth derived from a production function has to be definitionally identical to the weighted average of the growth rates of the wage and profit rates. Felipe et al. assert that this is problematic because it follows directly from the income accounting identity that relates value-added to the sum of the wage bill plus profits. Running their own regressions of Autor and Salomons' equations for employment growth, the authors demonstrate that while the results "work," it is because the regressions are ultimately an identity that will always hold. Therefore, Autor and Salomons (2018) suffers from the same Catch-22 problem of their previous study.

Felipe, Bajaro, Estrada, and McCombie acknowledge Autor and Salomons' attempt to shed light on the perennial question of the impact of innovation and productivity growth on employment, but conclude their methods leave this important question unanswered.

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Wage Differential between Palestinian Non-refugees and Palestinian Refugees in the West Bank and Gaza

SAMEH HALLAQ

Working Paper No. 941, December 2019

With refugees representing 41.2 percent of the total Palestinian population living in Palestine, Research Associate Sameh Hallaq investigates the wage differential between refugees and non-refugees in the West Bank and Gaza Strip to ascertain if, in accordance with the existing literature, discrimination is the driving factor behind the inequality.

The United Nations Relief and Works Agency for Palestine Refugees' (UNRWA) guidelines define a refugee as anyone residing in Palestine in the two years prior to the 1948 conflict who lost their home and livelihood as a result; in contrast to most refugees, descendants of these residents are also considered refugees. Such individuals are eligible for UNRWA assistance, including education, giving registered Palestinian refugees a higher education level than non-refugees. In spite of this, education's decreasing returns since the 1980s have resulted in poverty indices and unemployment levels that are nearly 10 percent higher than those of non-refugees. This is further compounded by the two Intifadas that affected the Palestinian economy and restricted movements across the Israeli border, where lower-skilled workers had previously earned better wages.

To determine if the differences in labor market outcomes are due to a refugee's characteristics or attributable to unexplained factors (i.e., discrimination), Hallaq uses data on employed, working-age individuals from the Palestinian Central Bureau of Statistics' labor force surveys for 1999–2012. The overall trends show that the unadjusted wage gap increased from 1999 through 2000, decreased sharply during the Second Intifada (2000–5), and then expanded afterward (except in 2009, when it was at its lowest).

Splitting the data between the West Bank and Gaza Strip, Hallaq finds that refugees in the West Bank earn lower unadjusted mean wages than non-refugees, while the opposite is true in Gaza. In a table of descriptive statistics, he summarizes the means of the potential wage determinants by socioeconomic characteristic (such as education and experience) and sectoral and occupational differences. With respect to West Bank workers, he finds that refugees and non-refugees have similar characteristics, though a larger percentage of non-refugees work in Israel, possibly explaining the positive wage gap in their favor. The analysis of the sectoral and occupational differences also shows similar distributions between refugees and non-refugees, with a few exceptions. For Gaza, refugees have higher experience and education levels than non-refugees, while a larger percentage of non-refugees work in Israel; the sectors of occupation are similar for both groups, with the exception of technical occupations, where the share of refugee workers is greater.

Following the literature, Hallaq builds his empirical model starting with a wage regression analysis, with variables representing demographic, human capital, and socioeconomic characteristics to capture the wage differences between the refugees and non-refugees, including quarterly and district fixed effects to capture any changes due to time variation shocks or geographical differences. Using the Oaxaca-Blinder decomposition, he separates workers' unobservable characteristics, such as their innate abilities, from those that are observable. Acknowledging the potential for selection bias, his results suggest that refugee status has a negative impact on workers' earnings in the West Bank, while showing a positive impact on earnings in Gaza.

To measure how much of the wage gap is attributable to the unexplained portion of workers' characteristics, Hallaq decomposes it into two parts: first to assess how much the refugees' mean wages would increase if they had the same characteristics as non-refugees, and then to demonstrate the unobserved characteristics' contribution, finding that 63 percent of the wage gap in the West Bank and 78 percent in Gaza is due to the observed characteristics. Decomposition by specific observed characteristics illustrates that working in Israel makes the most significant contribution in the West Bank, and the education and private sector coefficients are the most significant in Gaza. Looking at the differentials over time (excluding observations who report working in Israel), he finds evidence that lower wages for West Bank refugees are due to the unexplained part of the gap, while in Gaza they are attributable to workers' observed characteristics. Finally, he compares the wages of skilled and unskilled workers to find that the wage gap in the West Bank was the result of the explained portion through the Second Intifada, but attributed to the unexplained portion after, as low-skilled workers lost access to higher-paying jobs in Israel; in Gaza, the gap for both skilled and unskilled workers increased throughout the period under study.

Hallaq concludes that his results indicate the importance of policies encouraging the absorption of refugees in the labor force, particularly in the West Bank, and suggests that investments in education and the expansion of public sector employment, as well as continued US aid to the UNRWA, can help accomplish this.

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Program: Explorations in Theory and Empirical Analysis

Is China's Low Fertility Rate Caused by the Population Control Policy?

LIU QIANG, FERNANDO RIOS-AVILA, and HAN JIQIN

Working Paper No. 943, January 2020

Liu Qiang and Han Jiqin, Nanjing Agricultural University, and Research Scholar Fernando Rios-Avila investigate the cause of China's low fertility rate in an attempt to disentangle their strict population control policies' impacts—claimed to have prevented 400 million extra births from 1970–98—from those of the socioeconomic changes that accompany economic development. Using the synthetic control method (SCM) to analyze aggregate data on the year-over-year fertility rate, the authors identify the population control policies' effects by constructing a weighted combination of countries and regions as control units to estimate the Chinese birth rate in the policies' absence.

As in other developed countries, fertility rates in China have been falling for several decades and are currently below replacement levels. This decrease began shortly after the introduction of the "Later, Longer, and Fewer" (LLF) policy launched in the early 1970s, followed by the more strict "One Child Policy" (OCP), and reinforced in the late 1980s when the central government tied local officials' promotions to the fertility rate. Noting that countries with similar levels of development to China have also lowered their fertility rates during the same period through a combination of decreased infant mortality and increases in education and economic development, the authors attempt to fill the gaps in the literature by separating the short- and long-term effects of the population control policies from these other factors, suggesting that existing studies are based on oversimplified counterfactuals that ignore the role of socioeconomic factors. Tracing the history of China's policies, Qiang, Rios-Avila, and Jiqin point out that the LLF policy's strict enforcement beginning in 1973 marked a sharp drop in fertility rates, though China still enacted its more-strict OCP in attempt to further suppress births. Given the difficulty enforcing the OCP in rural areas, as well as its unintended consequences (such as labor shortages and female infanticide), the policy was relaxed to a one-and-a-half child limit in rural areas, then to a two child policy nationally. While these changes did bring a boom of second children, they did not increase the overall fertility rates, as the high cost of living increased the number of couples opting out of parenthood.

Using the World Bank's 2016 "World Development Indicators," the authors build their sample of 17 Asian and 51 developing countries. Their data demonstrates that all of the selected Asian countries also experienced declining fertility rates over the period (notably, Thailand's voluntary family planning program produced similar outcomes and its fertility converged with China's in the mid-1980s). To build their model, Qiang, Rios-Avila, and Jiqin use the SCM to synthesize a counterfactual "twin" China by weighting donor-country information based on how similar the variables were compared to China in the preintervention period; comparing the counterfactual and real data, the authors can ascertain the population control policy's effects. Because of the shared cultural and economic patterns, the authors use selected East Asian countries as the donor pool on which they base their analysis. They conduct several robustness checks: one against the data for other Asian countries and the other using data for developing countries/regions, as well as in-space placebo and leave-one-out sensitivity tests.

Empirical results for synthetic China demonstrate that the Asian donor pool synthesizes most closely with China's actual trajectory over the period and that the SCM estimates a reliable counterfactual from which to evaluate the population control policies' effects. No matter the donor pool chosen, the counterfactual is close to the observed birth rate in the preintervention period. It then widens significantly after the policy intervention starting in 1971 and peaks in 1978, leading the authors to contend that the OCP policy had little long-term effect and any policy-driven reduction in births was attributable to the earlier LLF policy. Turning to the year-by-year birth rate in the absence of a control policy, the authors estimate it is far fewer than the oft-cited 400 million births, ranging instead between approximately 164–268 million prevented births from 1971 to 2016.

The authors conclude that while the LLF policy had a significant impact on China's birth rate just after implementation, little effect is observed in the long run, with evidence suggesting that improving women's socioeconomic conditions may be a better way to facilitate population governance.
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