SENATOR SANDERS'S PROPOSED POLICIES AND ECONOMIC GROWTH

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According to an analysis by Gerald Friedman, Senator Sanders's proposed policies would result in average annual output growth of 5.3% over the next decade, and average monthly job creation of close to 300,000.[1] As a result, output in 2026 would be 37% higher than it would have been without the policies, and employment would be 16% higher.

Although we share many of Senator Sanders's values and enthusiastically support some of his goals, such as greater public investment in infrastructure and education, we also believe it is vitally important to be realistic about the impact of policies on the performance of the overall economy. For this reason, it is worth examining Friedman's analysis carefully. Moreover, Friedman has made available an extensive report describing his methodology and assumptions, allowing others to examine the specifics of his analysis.

Unfortunately, careful examination of Friedman's work confirms the old adage, "if something seems too good to be true, it probably is." We identify three fundamental problems in Friedman's analysis.

- First, all the effects of Senator Sanders's policies that he identifies are assumed to come through their impact on demand. However, his estimates of those ***demand effects are far too large to be credible***—even given Friedman's own assumptions.

- Second, in assuming that demand stimulus can raise output 37% over the next 10 years relative to the Congressional Budget Office's baseline forecast, Friedman is implicitly assuming that the U.S. economy is (and will continue to be for a long time) dramatically below its productive capacity. However, while some output gap likely still exists, ***the plausible range for the output gap is much too small to accommodate demand effects nearly as large as Friedman finds***. As a result, capacity constraints would likely lead to inflation and the Federal Reserve raising interest rates long before such high growth rates were realized.

- Third, a realistic examination of the ***impact of the Sanders policies on the economy's productive capacity*** suggests those effects ***are likely to be small at best***, and possibly even negative.

[1] Gerald Friedman, "What Would Sanders Do? Estimating the Economic Impact of Sanders Programs," January 28, 2016, www.dollarsandsense.org/What-would-Sanders-do-013016.pdf.

I. FRIEDMAN'S ESTIMATED DEMAND-SIDE EFFECTS ARE TOO LARGE TO BE CREDIBLE

In Friedman's analysis, all the effects of Senator Sanders's policies are assumed to come through their impacts on aggregate demand. He begins with CBO's economic projections for the path of output and employment without Senator Sanders's policies. He estimates the demand stimulus that would be provided by the Sanders policies and applies multipliers to them, yielding his output estimates (Friedman, pp. 9–10 and 23). For this analysis, Friedman uses a fairly conservative estimate of the multiplier of between 0.87 and 1.25 (Friedman, p. 23).

One fundamental problem with the analysis is that the estimated demand-side effects are grossly too large given Friedman's own estimates of the scale of the policies. Friedman reports that new government spending (excluding the spending associated with Senator Sanders's healthcare policies) would raise output in 2026 by about 9% relative to what it otherwise would have been; that the increases in the minimum wage and other regulatory measures that redistributed from wealthier (and higher-saving) households to poorer (and lower-saving) ones would add another 10%; and that single-payer healthcare would add another 14% (Friedman, Figure 12).[2] We discuss each of these in turn.

a. New Government Spending

Consider government spending (again, excluding healthcare policies). Friedman says that the additional spending under the proposed policies would rise from $300 billion in the first year to close to $600 billion in the fifth, and be between about $300 and $400 billion per year thereafter (Friedman, Table 19). As a share of CBO's baseline projection of nominal GDP, spending would peak at 2.4%, and in 2026 it would be just 1.4%. An output increase of 9% in 2026 from this amount of spending is grossly out of line with all existing evidence about the impact of changes in government spending.

To see this, it is important to realize that although temporary government spending, such as the roughly $1 trillion that Senator Sanders proposes to spend on infrastructure from 2017 to 2021, may have a powerful impact on output and employment in the near term, the demand effects would have faded away completely by 2026. The government would have stopped the temporary spending years before, and so it would have long since stopped contributing to demand. That is, temporary spending could cause a temporary boom, but its effect on the *level* of GDP a few years after its end will be, to a first approximation, *zero.*[3] For the permanent increase in spending, of which Senator Sanders is proposing roughly 1.4% of GDP, standard estimates indicate that it would increase GDP growth in the first year by between 1.4% and 2.2%. That is, the fiscal multiplier is between 1 and 1.6.[4] After the first year, the continued higher

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[2] There would also be a contribution of −5% from tax increases not associated with the healthcare plan, and some interactions among the different components, leading to the total of 37%.

[3] A good example of a standard analysis of the effect of temporary stimulus on GDP is CBO's report on the effects of the American Recovery and Reinvestment Act in 2014. The report concludes that because spending under the act first went up a great deal and then went down a great deal, to the point where it was very small in 2014, its impact on the level of GDP in 2014 was minimal. See Congressional Budget Office, "Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output in 2014," February 2015,
https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/49958-ARRA.pdf.

[4] For a summary of modern research on the size of the fiscal multiplier, see Christina D. Romer, "What Do We Know about the Effects of Fiscal Policy? Separating Evidence from Ideology," speech at Hamilton College, November 7, 2011,
http://eml.berkeley.edu//~cromer/Written%20Version%20of%20Effects%20of%20Fiscal%20Policy.pdf.
Since Friedman uses a multiplier of roughly 1, his multiplier estimate is relatively conservative.

spending would maintain the effect on the *level* of GDP, but not have any additional impact on its *growth* rate. Therefore, even under the assumption that output in 2026 will be determined entirely by demand rather than productive capacity (an assumption that we do not believe to be correct, as explained in Section II), GDP in 2026 would be higher (relative to the baseline) by at most about 2.2% from the permanent increase in government spending—not the 9% that Friedman estimates.

Thus, Friedman's figures for the effect of additional government spending exceed conventional ones by at least a factor of four. He offers no evidence for such effects. Indeed, his estimates appear inconsistent with his own assumptions: he assumes that rise in government spending of $1 would typically raise real output by slightly less than a dollar (Friedman, p. 47).[5]

We have a conjecture about how Friedman may have incorrectly found such large effects. Suppose one is considering a permanent increase in government spending of 1% of GDP, and suppose one assumes that government spending raises output one-for-one. Then one might be tempted to think that the program would raise output *growth* each year by a percentage point, and so raise the *level* of output after a decade by about 10%. In fact, however, in this scenario there is no additional stimulus after the first year. As a result, each year the spending would raise the *level* of output by 1% relative to what it would have been otherwise, and so the impact on the level of output after a decade would be only 1%.

b. Redistribution

Friedman's analysis of the demand-side effects of redistribution is similarly problematic. He reports a demand "stimulus" from these changes that rises rapidly to 1% of baseline GDP in 2020 and then increases gradually further to 1.45% in 2026 (Friedman, Table 20). It is quite unclear what Friedman means by stimulus in this case.

One possibility is that it is some type of fiscal impulse coming from redistribution. In this case, it would presumably be comparable in its effects on GDP to a permanent increase in government spending of a similar size. Under this interpretation, an increase in output in 2026 of 10% in response to a fiscal impulse of at most 1.45% of GDP is vastly above what standard methods would predict. To see this, suppose that a fiscal impulse from redistribution of 1.45% of GDP occurred in 2017. Using a standard multiplier of between 1 and 1.6, this would increase GDP growth (and hence also the level of GDP) in 2017 by at most 2.3%. But, like a permanent increase in government spending, the redistribution would have no effect on GDP *growth* after the first year. As a result (and again, even if output in 2026 is entirely demand-determined, which as explained in Section II we find unrealistic), the *level* of GDP in 2026 (relative to the baseline) would only be higher by at most 2.3%—not the 10% that Friedman estimates.

Another interpretation of what Friedman means by the stimulus from redistribution is that it is, in fact, the impact of the redistribution on GDP. This interpretation appears to be

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[5] There is some ambiguity in Friedman's Figure 12, so that one possible interpretation is that the non-health government spending would raise output by 14% rather than 9% in 2026. In this case, his estimate of the effects is higher than what conventional methods would yield for a permanent increase in government spending of 1.4% of GDP by more than a factor of six. And using Friedman's own assumption about the multiplier, his estimated impact exceeds what conventional calculations would yield by roughly a factor of ten.

consistent with how Friedman describes his calculation of the stimulus.[6] If this interpretation is correct, Friedman's Table 20 provides further evidence of the conceptual error we think he may have made for government spending. In each of the last five years of Friedman's analysis, the "stimulus" from redistribution is between 1 and 1.45% of GDP—consistent with the view that there is, for example, a one-time permanent change in overtime rules, and a permanent increase in the minimum wage that is fully phased in by 2020. This points to an impact on the level of GDP in each of these years between 1 and 1.45% of GDP (again, unrealistically assuming no capacity constraints). And yet Friedman's effect on GDP of redistribution in 2026 (given in Table 12) is 10%—which is the sum of the ten annual effects. Since a permanent change would raise the level of GDP in the first year and then leave it at the higher level, summing is not appropriate.

Thus, under either interpretation, Friedman's estimates of the demand-side effects of redistribution (like those for government spending) are vastly too large to be plausible.

c. <u>Healthcare Policies</u>

It is less clear how to analyze the healthcare components of Senator Sanders's policies. The effects of healthcare policies are complicated, and Friedman's discussion of the macroeconomic effects has many parts. Thus, the analysis in this section should be viewed as particularly tentative.

In thinking about the demand effects of the plan, there are two natural benchmarks. One is the case where the government provides exactly the same healthcare, at exactly the same prices, but replaces healthcare costs paid for by employers and employees with taxes of the same amount. In that situation, there would be no clear reason for anyone to change their spending, and so the plan would neither stimulate nor reduce demand.

The other benchmark for the demand effects is one where (as in the first case) the plan does not change the situation regarding existing care, but provides additional care paid for by the government with no offsetting tax increases or spending cuts. In this case, the stimulus to demand would be just the additional spending. Friedman estimates this additional spending as roughly 2.4% of GDP, and he implies that it would be reached by 2017 and then be fairly steady after that (Friedman, pp. 38–39).

Thus, it appears that the demand stimulus from the healthcare plan would be similar to that of a permanent increase in government spending of between 0 and 2.4% of GDP.[7] Like any other permanent demand stimulus, this would raise the growth rate of GDP only in the first year

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[6] For example, to calculate the stimulus from new rules about overtime, Friedman multiplies his estimate of the increase in wages by 0.9 (which he says is the multiplier for wages) and subtracts off the 50% of the cost that he assumes comes from profits times 0.35 (which is his multiplier for profits) (Friedman, p. 29).

[7] In principle, the stimulus could be larger than 2.4% of GDP if a sufficiently large part of the financing of the healthcare that people were previously receiving were shifted from the less wealthy to the wealthy. However, this does not appear to be relevant in practice. Friedman states that the healthcare plan would involve additional taxes of about $450 billion per year on the wealthy and additional spending of about $400 billion per year (Friedman, Table 18 and pp. 38–39). In this case, the additional stimulus from higher disposable incomes of the less wealthy through this channel would be small, and would be more than offset by the reduction in demand caused by higher taxes on the wealthy. Furthermore, other independent analyses of the Sanders health plan, such as by Kenneth Thorpe ("An Analysis of Senator Sanders Single Payer Plan," January 2016, http://www.scribd.com/doc/296831690/Kenneth-Thorpe-s-analysis-of-Bernie-Sanders-s-single-payer-proposal#scribd), suggest that higher taxes would be necessary to finance the plan. Thus, it appears that a demand stimulus of 2.4% of GDP remains an upper bound.

(by between 0 and at most 3.8%) and the level in the first and *all subsequent years* by at most the same amount (once again assuming no capacity constraints). Thus, it could not possibly raise output by the 14% that Friedman estimates.[8]

d. Summary

The bottom line of this analysis is that even if Friedman were correct that effects through demand were the only determinant of output, his estimates of the likely demand effects are ***dramatically*** higher than standard approaches imply.

II. PRODUCTIVE CAPACITY CONSTRAINTS ARE LIKELY TO BE BINDING

A second problem with Friedman's analysis is that even if the estimated effects of Senator Sanders's policies on demand were correct, it is highly unlikely that the impact on output that he foresees could actually come to pass. That is because productive capacity constraints would be likely to bind well before output rose nearly as much as Friedman predicts. Implicit in Friedman's focus on demand-side effects is the assumption that there is currently a very large output gap (or spare capacity) that could be closed before inflation rose significantly and the Federal Reserve raised interest rates substantially to choke off demand.

However, a wide range of evidence suggests that while there is likely some output gap currently, it is not nearly large enough to accommodate growth of 5.3% per year for ten years without pushing the economy well above its productive capacity.

a. Standard Indicators of Slack

First, standard indicators of slack suggest that the output gap is currently no more than moderate. The unemployment rate, at 4.9%, is at normal levels. A broader measure of unemployment (the "U-6" measure) is just 2 percentage points above its low point before the 2008 recession. The Federal Reserve index of capacity utilization is about 4 percentage points below its pre-recession level. Job vacancies, which one would expect to be low with vast slack, are above their pre-recession levels. And inflation, which one would expect to fall in an economy operating far below capacity, is flat or perhaps creeping slightly upward. None of this is remotely consistent with a shortfall of output from capacity of even 10%, much less the amount that would be needed to accommodate Friedman's estimate that the Sanders policies would raise output in 2026 37% above the CBO forecast.

b. Expert Opinion

Second, experts think that slack is small. The two institutions that devote the most resources to estimating the economy's productive capacity are probably the Congressional

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[8] One could also argue that moving to a single-payer system would deliver efficiency gains, and so raise output. It appears that (continuing to assume that output is determined by demand) this would raise the output effects somewhat, but lower the employment effects. As a concrete example, suppose more efficient administration allows the same healthcare to be delivered with fewer workers, and that these savings are passed on to the households receiving the healthcare. Their disposable incomes are higher, and so their demand is higher. This will tend to increase output. But, under standard assumptions, the additional employment generated by this increase in demand will not be enough to offset the direct downward impact on employment from the fact that fewer workers are needed to deliver a given amount of healthcare.

Budget Office, which uses those estimates as an essential input into its economic forecasts and budget projections, and the Federal Reserve, for which estimates of slack are a critical input into its decisions about monetary policy. CBO estimates that as of the end of 2015, output was 2.2% below potential.[9] Federal Reserve Chair Janet Yellen has recently argued that the unemployment rate, which has returned to normal levels, likely understates the amount of slack in the labor market by perhaps half a percentage point—suggesting a positive but small shortfall of output from capacity.[10]

Professional forecasters also have a strong interest in correctly estimating the productive capacity of the economy, since the estimate of productive capacity often factors into their projections of monetary policy and inflation. The Third Quarter 2015 Survey of Professional Forecasters, conducted by the Federal Reserve Bank of Philadelphia, asked forecasters for their estimate of the natural or normal rate of unemployment. The median estimate was 5.0%—just above the current unemployment rate.[11] This suggests that, at least by this measure, professional forecasters see little if any slack in the current economy.

c. Comparison of Current GDP to the Pre-Recession Trend

A final way to estimate the amount of slack in the economy is to imagine that the trend path the American economy was on before the Great Recession had continued through today. This approach assumes that none of the decline in labor force participation, lost investment, and slow productivity growth during the recession was permanent, and thus that the growth rate of the economy's productive capacity has not been affected by the recession. This scenario is almost surely highly optimistic. Careful analyses suggests that labor force participation was bound to decline over the past eight years (and to continue declining) because of demographic factors such as the aging of the baby-boom generation.[12] More broadly, a range of recent research finds that the growth rate of productive capacity began to decline even before the Great Recession, and so productive capacity is now well below the path it was on before the crisis.[13]

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[9] CBO estimates that potential real GDP, in billions of chained 2009 dollars, was $16,809 in the fourth quarter of 2015 (https://www.cbo.gov/sites/default/files/51137-2016-01-PotentialGDP.xlsx). Actual real GDP was $16,442.3 billion.

[10] Janet L. Yellen, "Inflation Dynamics and Monetary Policy," speech at the University of Massachusetts, Amherst, September 24, 2015, especially pp. 9–10 and n. 31,
www.federalreserve.gov/newsevents/speech/yellen20150924a.pdf.

[11] Federal Reserve Bank of Philadelphia, "Third Quarter 2015 Survey of Professional Forecasters," August 14, 2015, https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/2015/survq315.

[12] For example, Stephanie Aaronson, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher Smith and William Wascher, "Labor Force Participation: Recent Developments and Future Prospects," *Brookings Papers on Economic Activity*, Fall 2014, 197–255,
www.brookings.edu/~/media/Projects/BPEA/Fall-2014/Fall2014BPEA_Aaronson_et_al.pdf?la=en;
and U.S. Council of Economic Advisers, "The Labor Force Participation Rate Since 2007: Causes and Policy Implications," July 2014,
www.whitehouse.gov/sites/default/files/docs/labor_force_participation_report.pdf.

[13] For example, International Monetary Fund, "Where Are We Headed? Perspectives on Potential Output," *World Economic Outlook*, April 2015, Chapter 3, 69 – 110,
www.imf.org/external/pubs/ft/weo/2015/01/pdf/c3.pdf; and John Fernald, "Productivity and Potential Output before, during, and after the Great Recession," *NBER Macroeconomics Annual* 29 (2014), 1–51,
http://www.jstor.org/stable/10.1086/680580.

Assuming that GDP after 2007 continued to grow at the rate of 2.7% per year that it grew from 2001 to 2007, suggests that GDP is currently about 12% below trend.[14] A similar exercise for employment suggests that employment today is about 6 million below its pre-recession trend path.[15]

These numbers for the possible output and employment gaps are certainly much larger than those from other ways of estimating them. But even they pale in comparison to what Friedman is projecting would happen under Senator Sanders's policies. To see this, imagine projecting the pre-recession trend forward to 2026. Real GDP in 2007 (measured, as Friedman does in 2015 dollars) was $16.6 trillion. Projecting forward at an annual growth rate of 2.7% gives $27.4 trillion in 2026. Friedman projects that GDP under the Sanders policies will be $31.9 trillion in 2026 (Friedman, Table 4)—16% larger. A way to put these numbers into perspective is that real GDP would need to grow by 5.3% per year (as Friedman claims it will under the Sanders policies) for only 5 years before GDP would be above the path it was on before the financial crisis.

Employment (measured, following Friedman, using the household survey) was 146 million in 2007, and trend growth was about 1.2 million per year. Projecting this forward to 2026 gives 169 million jobs. Friedman projects 185 million under Senator Sanders's policies. Given Friedman's estimates of employment growth under the Sanders policies, it would only take 2½ years before employment was above it pre-recession path.

Another way to gauge the trend path the economy was on before the Great Recession is to examine pre-recession forecasts. For concreteness, we look at GDP forecasts from August 2007, when both the staff of the Federal Reserve and CBO made forecasts of potential output. The Federal Reserve staff (which devotes an exceptional amount of resources to forecasting and generally outperforms other forecasters) estimated potential output growth at 2.2% per year and projected that output was 0.7% above capacity as of the fourth quarter of 2006.[16] Output today is 7.5% below that path. CBO forecast somewhat higher growth of potential and actual output, 2.7%, implying an output gap of 12% today.[17] Because the Great Recession and its aftermath

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[14] Other authors who have done related analyses but found larger current output gaps have used even more optimistic (and less plausible) estimates of normal growth. For example, Matthew Klein (http://ftalphaville.ft.com/2016/02/17/2153540/extreme-doesnt-mean-what-it-used-to-sanders-vs-the-cea) projects the trend based on average annual growth over the period 1984 to 2007 (which is 3.3%). This includes the very rapid growth in 1984 (when the United States was recovering from the severe 1982 recession) and the extraordinary growth of the late 1990s.

[15] Employment (measured, following Friedman, using the household survey) was 146 million in 2007, and we use the standard estimate of trend growth of 100,000 per month, or 1.2 million per year (see, for example, Daniel Aaronson and Scott Brave, "Estimating the Trend in Employment Growth," Chicago Fed Letter No, 312, July 2013,
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjI9aCzuYjLAhVFwmMKHUMQD9MQFggcMAA&url=https%3A%2F%2Fwww.chicagofed.org%2F~%2Fmedia%2Fpublications%2Fchicago-fed-letter%2F2013%2Fcfljuly2013-312-pdf.pdf&usg=AFQjCNFZhX-nnzK8D4n0TGvBjvB2zPy1Kg&sig2=oEe2Zc5O5Thf02HVj6sphg&bvm=bv.114733917,d.cGc&cad=rja).
Thus, projected employment today is 156.3 million, while actual employment is 150.5 million.
[16] http://www.federalreserve.gov/monetarypolicy/files/FOMC20070807gbpt120070802.pdf.
For evidence on the Federal Reserve's forecasting abilities, see Christina D. Romer and David H. Romer, "Federal Reserve Information and the Behavior of Interest Rates," *American Economic Review* 90 (June 2000): 429–457, http://eml.berkeley.edu/wp/c+dromer_aer2000.pdf.
[17] https://www.cbo.gov/sites/default/files/51137-2007-08-PotentialGDP.xls and
https://www.cbo.gov/sites/default/files/110th-congress-2007-2008/dataandtechnicalinformation/8565_TableC-1_0.xls.

have almost surely had some impact on productive capacity, these estimates very likely overstate current slack. Even so, they suggest that Friedman's view that there can be a demand-driven output expansion of 37% is not remotely feasible.

d. Friedman's Own Estimates of Productive Capacity Are Particularly Extreme

How then does Friedman think that an enormous increase in output without hitting capacity constraints is feasible? There are two key ingredients of his explanation. First, he assumes that demand expansion can bring the fraction of the adult population that is employed back to its level in 2000. That is, demand expansion can reverse not just the entire fall in the employment-to-population ratio since in the Great Recession and its aftermath, but the substantial decline in the years before the recession. Second, he argues that as demand expansion raised output, endogenous productivity growth (and, to a lesser extent, endogenous immigration) would raise productive capacity by enough to prevent it from constraining output.

Both ingredients are highly problematic. The view that the employment-to-population ratio as of 2000 represents normal employment that can be achieved solely through demand expansion (and that it will continue to do so for the next decade) implies that the economy had substantial slack even before the Great Recession, that *none* of the fall in the ratio since 2007 reflects long-run factors, and that demographic changes will exert no downward pressure on the ratio over the next decade. This is a highly unconventional view, and Friedman presents essentially no evidence for it. Second, the evidence that productivity growth would surge as a result of a demand-driven boom is weak. The fact that there is a *correlation* between output growth and productivity growth is not surprising. Periods of rapid productivity growth, such as the 1990s, are naturally also periods of rapid output growth. But this does not tell us that an extended period of rapid output growth resulting from demand stimulus would *cause* sustained high productivity growth.[18]

e. Friedman's Growth Projections in Historical Context

A glance at American history confirms the infeasibility of sustained growth over 5% as a result of demand stimulus today. Growth above 5% has certainly happened for a few years, such as coming out of the severe 1982 recession. But what Friedman is predicting is 5.3% growth for 10 years straight. The only time in our history when growth averaged over 5% for a decade was during the recovery from the Great Depression and the years of World War II. But that involved moving from 25% unemployment to an economy pushed well above its normal capacity by the necessity of fighting a world war. Today we are not starting from remotely the same level of slack (the unemployment rate is *one-fifth* its level at the trough of the Depression), nor facing a national imperative that would allow us to push our economy far beyond its normal limits.

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[18] It is well known that in the short run, a demand-driven boom raises measured productivity, through such channels as firms using their workers more intensively and moving them from activities like deferred maintenance to production. But the scope for such changes is limited, and thus they could not lead to sustained high productivity growth in response to a large, long-lasting demand expansion. For the impact of demand-driven output changes on measured productivity, see N. Gregory Mankiw, "Real Business Cycles: A New Keynesian Perspective," *Journal of Economic Perspectives* 3 (September 1990): 79–90, http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.3.3.79. For some evidence about the mechanisms, see Jon A. Fay and James L. Medoff, "Labor and Output over the Business Cycle: Some Direct Evidence," *American Economic Review* 75 (September 1985): 638–655, http://www.jstor.org/stable/1821345?seq=1#page_scan_tab_contents.

f. Implications of Taking Productive Capacity into Account

Massive demand-side stimulus in an economy closing in on its productive capacity would have one of two effects. First—and most likely—it would lead the Federal Reserve to raise interest rates, offsetting as well as it could the expansionary effects of the stimulus. Output would rise little, and the main effects would be on interest rates and on the composition of output between the components stimulated by the fiscal expansion and the components restrained by higher interest rates. Second, if the Federal Reserve did not respond, the result would be inflation. And if the stimulus were large enough to try to push the economy 10%, 20%, or more above its productive capacity, the inflation would be substantial.

III. THE IMPACT OF THE SANDERS POLICIES ON PRODUCTIVE CAPACITY IS LIKELY SMALL

By most estimates, the economy, while currently below its normal productive capacity, is closing in on it. As a result, independent of whether Senator Sanders's policies are adopted, the main determinant of output a decade from now will be our productive capacity, not whether there is sufficient demand. Thus, the main way in which the policies would affect the overall economy would be through their impacts on our productive capacity, not demand. It is therefore important to consider what those impacts might be. To be sure, a number of these policies may be justified by goals other than their effects on productive capacity, but we focus on their impact on productive capacity here since our analysis concerns the effects on economic growth.

a. Possible Positive Impacts of Senator Sanders's Policies on Capacity

Senator Sanders's proposals would likely act to raise productive capacity in several ways. Most directly, infrastructure and education make the economy more productive. If Senator Sanders's policies led to an additional $1.5 trillion of investment in these areas over the next decade and those investments have a rate of return of 10% (which appears to be a reasonable estimate for well-targeted public investments), this would raise output in 2026 by $150 billion, or somewhat less than 1%.[19] Since this is an effect over ten years, the implied increase in average annual growth of capacity (or potential output) is less than a tenth of a percentage point. Thus, although there is a strong case for greater public investment based on its rate of return and on its potential impact on quality of life and equality of opportunity, it would not yield a fundamental change in the economy's growth trajectory.

Likewise, there is evidence that family-friendly policies, like parental leave, help keep workers in the labor force.[20] And regulatory and tax changes that benefited low-income workers would make work more attractive. Again, such policies have much to recommend them. But it is hard to see how they would make more than a dent in the long-term decline in labor force participation. If moderate increases in the attractiveness of work had large influences on labor supply, the huge rise in wages over the past century would have been associated with a corresponding surge in labor supply, but it has not.

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[19] See, for example, Edward M. Gramlich, "Infrastructure Investment: A Review Essay," *Journal of Economic Literature* 32 (September 1994), 1176–1196, http://www.jstor.org/stable/2728606; and Congressional Budget Office, "Issues and Options in Infrastructure Investment, May 2008, https://www.cbo.gov/sites/default/files/110th-congress-2007-2008/reports/05-16-infrastructure.pdf.

[20] Henrik Jacobsen Kleven, "How Can Scandinavians Tax So Much?" *Journal of Economic Perspectives* 28 (November 2014), 77–98, http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.28.4.77.

A final item on the positive side of the ledger is that there are some inefficiencies in the current healthcare system that might be reduced by moving to a single-payer system. Removing such inefficiencies would increase productive capacity.[21] But private healthcare spending is only about 10% of GDP. If the entire difference in administrative costs between private and public healthcare were waste (an obvious overstatement), the potential savings are only about 1.5% of GDP.[22] Thus, without other quality-enhancing reforms to slow the growth of healthcare costs, the potential contribution to the growth of productive capacity is no more than moderate.

b. Possible Negative Impacts of Senator Sanders's Policies on Capacity

Against these potential positives, there are features of Senator Sanders's proposals that could work to slow the growth of productive capacity. The higher interest rates resulting from demand expansion that led to inflation would lower investment, and so slow growth of capacity. More generous Social Security, while surely desirable for poorer Americans, would cause some people to retire earlier. Strengthening disability insurance, another laudable goal, would likely lead to more people being on the program. Making public colleges free would cause some people to spend longer in school and less time working. And extensive research, to which we have contributed, shows that although the disincentive effects of higher tax rates are small, they are not zero.[23]

Potentially more worrisome are the extensive interventions in the labor market. The experiences of many European countries from the 1970s to today show that an overly regulated labor market can have severe consequences for normal unemployment.[24] There are strong arguments for raising the minimum wage; and over the range observed historically in the United States, the short-run employment effects of moderate increases appear negligible.[25] But doubling the minimum wage nationwide, adding new requirements for employer-funded paid vacations and sick leave, and increasing payroll taxes substantially would take us into uncharted

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[21] Council of Economic Advisers, "The Economic Case for Health Care Reform," June 2009, https://www.whitehouse.gov/assets/documents/CEA_Health_Care_Report.pdf.

[22] For example, Diane Archer, "Medicare Is More Efficient Than Private Insurance," Health Affairs Blog, September 20, 2011, cites data for administrative costs of 2% of Medicare spending and 17% of spending through private insurance (http://healthaffairs.org/blog/2011/09/20/medicare-is-more-efficient-than-private-insurance/).
15% (the difference between the two figures) times 10% of GDP (private healthcare spending) is 1.5% of GDP. For an example of a defense of the value of administrative spending, see America's Health Insurance Plans, "Myth vs. Fact: Administrative Costs in Medicare and Private Health Plans," January 3, 2014, http://www.ahipcoverage.com/2014/01/03/myth-vs-fact-administrative-costs-in-medicare-private-health-plans/.

[23] For a survey of this work, see Emmanuel Saez, Joel Slemrod, and Seth H. Giertz, "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review," *Journal of Economic Literature* 50 (March 2012), 3–50, http://eml.berkeley.edu/~saez/saez-slemrod-giertzJEL12.pdf. For our contribution, see Christina D. Romer and David H. Romer, "The Incentive Effects of Marginal Tax Rates: Evidence from the Interwar Era," *American Economic Journal: Economic Policy* 6 (August 2014), 242–281, http://eml.berkeley.edu//~cromer/Romer%20and%20Romer%20Incentive%20Effects%20AEJ%20Policy.pdf .

[24] For example, Stephen Nickell, "Unemployment and Labor Market Rigidities: Europe versus North America, *Journal of Economic Perspectives* 11 (Summer 1997), 55–74, http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.11.3.55.

[25] John Schmitt, "Why Does the Minimum Wage Have No Discernible Effect on Employment?," Center for Economic and Policy Research, February 2013 www.cepr.net/documents/publications/min-wage-2013-02.pdf, and David Card and Alan B. Krueger, *Myth and Measurement: The New Economics of the Minimum Wage* (Princeton University Press, 1995).

waters. Obviously, these changes would not bring the United States all the way to levels of labor market regulation of many European countries in the 1970s. But they are large enough that one can reasonably fear that they could have a noticeable impact on capacity growth.

Finally, although there are potential efficiency gains from single-payer healthcare, there are also potential costs. Free healthcare for all with no deductibles or copays could result in more high-cost, low-value treatments. And replacing the Affordable Care Act would mean abandoning the various features of the act that appear to have played a role in slowing the growth of healthcare costs, such as the initiatives to promote more effective, high-quality ways of delivering care.[26]

c. Net Impact

The overall effects of Senator Sanders's policies on the growth of productive capacity are at best likely to be small. The features of his proposals that increase normal growth are themselves probably small, and the features that may reduce normal growth are many. Indeed, it is not out of the question that the net impact of the policies on the growth of productive capacity would be negative.

IV. CONCLUSION

The bottom line of our evaluation of Professor Friedman's analysis is that it is highly deficient. The estimated demand-induced effects of Senator Sanders's policies are not just implausibly large but literally incredible. Moreover, even if they were not deeply flawed, Freidman's enormous estimates of demand-fueled growth could not and would not come to pass. Even very generous estimates of the amount of slack still present in the American economy would not be enough to accommodate demand-driven growth of anything near what Friedman is estimating. As a result, inflation would soar and monetary policy would swing strongly to counteract them. Finally, a realistic evaluation of the impact of Senator Sanders's policies on productive capacity (something that is neglected in Friedman's analysis) suggests that those impacts are likely small and possibly negative.

Though we have been frankly critical of Professor Friedman's analysis, he has provided a service to public debate by posting his analysis so that other economists can evaluate its validity. We are posting our evaluation in the same spirit.

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[26] U.S. Council of Economic Advisers, "Recent Trends in Health Care Costs, Their Impact on the Economy, and the Role of the Affordable Care Act," Chapter 4 of *Economic Report of the President* 2014, 147–178, www.whitehouse.gov/sites/default/files/docs/erp_2014_chapter_4.pdf.