The 2015 Martin Feldstein Lecture

How Tight Is the Labor Market?

Alan B. Krueger*

It is a great honor for me to give the Martin Feldstein Lecture. I first met Marty when I was a research assistant at the NBER in the summer of 1984, shortly after he returned from serving as chairman of the Council of Economic Advisers (CEA). Later that year, I was fortunate to learn public finance at Harvard from both Marty and Larry Summers. They taught me a tremendous amount and sparked my passion for using economics in public policy. Marty also often visited me when I was chairman of the CEA, and I benefited from his wise counsel and encouragement.

Today, I’m going to talk about a question that Marty and I have discussed on many occasions: How tight is the labor market? In essence, I think this issue boils down to two questions. First, how should we think about the U-6 measure of labor slack? I won’t delve into this question, however, because U-6 is elevated due to a large number of part-time workers who report that they would prefer to work full-time. The recent rebound in the average work week, however, suggests that there isn’t substantial slack on the hours front. Hours appear to be back to normal. The second question, in my view, is the more important one: What’s going on with long-term unemployment? Are the long-term unemployed more likely to leave the labor force or find a job? And if the long-term unemployed have already left the labor force, are they likely to come back?

By 2013 short-term unemployment had returned to normal levels. So at that time I argued that if we were going to make further progress in lowering the unemployment rate, it would be because the long-term unemployed either found jobs or left the labor force. My feeling at that time was that, unless we focused public policy on improving the odds of the long-term unemployed finding a pathway back to work, the natural forces that determine the ebb and flow of labor market participation would lead many of these workers to exit the labor force. Unfortunately, as we will see, the historical pattern in which the long-term

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unemployed tended to increase their labor force exit rate over the course of the business cycle has reas-
serted itself during the current recovery, and this has had a significant effect on the job market.

About a year and a half ago, I wrote a Brookings paper on this topic with two Princeton graduate stu-
dents, Jared Cramer and Davor Kuc. Part of what I'm going to do in today's lecture is summarize and extend our results. Specifically, I'll focus on where we got things right, where we got things wrong, and what we can learn from this experience.

I had the same diagnosis for the last five years. I think the outlook for the U.S. labor market has been one of gradual healing from the terrible wounds that were inflicted by the Great Recession. We've seen the unemployment rate come down from a peak of about 10 percent in October 2009 to just under 5 percent in June 2013, which represents real progress. In fact, apart from the early 1980s, when we got things right, where we got some things wrong, and where we learned from our experience.

The picture isn't quite as rosy if you look about 25 percent in June (Figure 2).

employment-to-population ratio declined by about 5 percentage points during the decade that fol-
sion officially ended.

The decline in labor force partic-
ipation didn't accelerate until after the reces-
sion. Instead, unemployment rates continued to fall, and over what was in the labor force actu-
al increase in the school enrollment, which should be a net positive for the econ-
omy in the long run. The remaining quarter — or a little over a per-
centage point — of the overall decline in labor force participation is likely attribut-
able to cyclical factors. I will present evidence that suggests that it's unlikely we'll see much of a recovery for this segment of the population going forward.

Now, I've been on record predict-
ing little cyclical rebound in labor force participa-
tion for quite a while. In March 2011, for exam-
ple, I wrote an article for Bloomberg in which, with unusual understatement, I predicted "we might well see the labor force shrink-
ning more even as the mea-
sured unemployment rate falls." I faced some criti-
icism at the time for this contrari-
an view. As an example of the contrarian wisdom, Goldman
Sachs’s well-regarded economics research group has published a series of reports over the past four years in which they’ve repeatedly predicted that labor force participation would stabilize or rise as the recovery continued. Instead, the data have clearly shown a persistent decline.

The following chart (Figure 4), an earlier version of which accompanied my Bloomberg article, shows why I was expecting labor force participation to continue to decline. Specifically, it shows
for the long-term unemployed.

In contrast to labor force exits, the job finding rate is much higher and more pro-cyclical for the short-term unemployed than it is for the long-term unemployed (Figure 5). For example, workers who have been unemployed for less than four weeks have about a 35 percent chance of finding a job in any given month. This rate tends to be higher when the economy is stronger, and it tends to be lower during a recession. Conversely, the job finding rate for workers who have been unemployed for more than a year starts off at a lower level and moves very little over the course of the business cycle. Our research suggests that changes in the observed composition of the unemployed workforce play a relatively small role in these trends, explaining for no more than 20 percent of these cyclical patterns.

If you’re familiar with the CPS, you know that the data can be extremely noisy—particularly with respect to how workers report the duration of their unemployment spells from month to month. So, in our Brookings paper, we also used data from the Survey of Income and Program Participation (SIPP) to look at the likelihood of an unemployed worker returning to steady employment one year later. The SIPP data indicate that, irrespective of the business cycle, the probability that an unemployed worker will be “steadily” employed in a full-time job is at least statistically—against the long-term unemployed. Kory Kroft, Fabian Lange, and Matt Notowidigdo conducted a study in which they estimated a structural job matching model in order to explain the cyclical behavior of the long-term unemployed during the Great Recession. Specifically, Kroft et al. were able to account for the observed rise in long-term unemployment during the Great Recession. Specifically, Kroft et al. were able to account for the observed rise in from the CPS bear this out (Figure 6). According to CPS data, the monthly rate for transitioning from out of the labor force to back in the labor force is unrelated to the business cycle. We didn’t see a wave of people returning to the labor force either in the late 1990s or earlier in the 2000s, and we’re not seeing one now.

Personally, I think the presumption that labor force participation would bounce back in the current recovery comes from a misreading of what happened during the 1980s. A lot of people remember that labor force participation rose sharply after the double-dip recession ended in 1982. However, if you make a linear forecast based on the data from 1970 to 1979, the labor force participation rate stayed about a percentage point below the previous trend line and never caught up (Figure 7). We did a more sophisticated version of this analysis when I was at the CEA. We looked at the trends in labor force participation for various demographic groups both during the decade before the 1980 recession as well as the decade before the Great Recession. We concluded that, after adjusting for the business cycle, both recessions caused the overall labor force participation rate to be roughly a percentage point lower than it would have been otherwise. Thus, I think there is a coherent story on labor force participation. Over the course of the business cycle, the long-term unemployed increasingly withdraw from the labor force, and they do not tend to return in large numbers as the economy strengthens.

Figure 5

Figure 6

Figure 7

The Beveridge Curve

An implication of the cyclical patterns in transition rates for the long-term unemployed is that the relationship between vacancies and unemployment will vary over the course of the business cycle. Indeed, previous studies have found that the Beveridge curve, which measures the inverse relationship between job openings and the unemployment rate, tends to shift outwards during a recession. For instance, research by Peter Diamond and Aysegul Sahin suggests that the Beveridge curve typically loops around as the economy recovers from a downturn and eventually returns to its previous position.

Kory Kroft, Fabian Lange, Matt Notowidigdo, and Larry Katz did very nice work where they estimated a structural job matching model in order to explain the cyclical behavior of the long-term unemployed during the Great Recession. Specifically, Kroft et al. were able to account for the observed rise in the share of unemployed workers who had been out of work for more than six months as well as reproduce an outward shift in the Beveridge curve using their matching model.

In our Brookings paper, we extended their model along two dimensions to more...
The long-term unemployment rate has declined more than the short-term unemployment rate since the Great Recession. It’s worth noting that the period over which we fit the matching function does not coincide with any notable extensions of the duration of unemployment insurance benefits. So the matching model does not rely on the passage of extended unemployment benefits in order to explain the rise in long-term unemployment during the Great Recession. In addition, we restricted our analysis to workers who were 25 to 54 years old to limit the impact of workers either retiring early or returning to school, both of which are known to lower the share of workers leave the labor force. Despite these restrictions, the long-term unemployed are still relatively more likely than the short-term unemployed to exit the labor force as the economy strengthened. This counterintuitive finding has been a puzzle, and we have conducted an alternative explanation for the shift in the Beveridge curve: Companies may have become more selective in their hiring processes and, as a result, the nature of vacancies may have changed in recent years. The longer the shift in the Beveridge curve persists, the more seriously I take their hypothesis.

### What About Wages?

If the labor market is getting tighter — as the decline in the unemployment rate suggests — we should have seen a pickup in job finding rates for such workers had remained at its average for 2010 instead of rising modestly as the economy strengthened. This counterfactual exercise indicates that the improved job finding rate for the long-term unemployed is not accounted for about 10 percent of the decline in the share of long-term unemployment since 2010. We also conducted counterfactual analyses that focused on the nearly 4 percent point decline since 2010 in the unemployment rate itself. The rise in the job force withdrawal rate for the long-term unemployed appears to have been responsible for roughly 20 percent of the decline in the overall unemployment rate. The improvement in the job finding rate, by contrast, accounts for only about 5 percent of the drop in the total unemployment rate since the Great Recession.

There is one area in which the forecast from our Brookings paper fell notably short. Our matching model has not done a particularly good job in predicting the recent path of the Beveridge curve, one has to acknowledge that it has not occurred yet. These results raise the question of whether the labor market is more efficient now than it had been in the past. I have to say that those who have published groundbreaking research by Eddie Lazear and Jim Spletzer also cast doubt on such an interpretation. Steve Davis and John Haltiwanger have produced an alternative explanation for the shift in the Beveridge curve: Companies may have become more selective in their hiring processes and, as a result, the nature of vacancies may have changed in recent years.

Several economists have done analyses along these lines using aggregate time series data and concluded that the long-term unemployed put less pressure on inflation. An older paper by Ricardo Llaudes found that the Phillips curve fit better for vari- ous deciles of wages than the Phillips curve on the short-term unemployment rate rather than the overall rate. These results are consistent with the view that the long-term unemployed are on the margins of the labor market. Of course, others have presented alternative explanations for why inflation did not decline by very much during the Great Recession. Ben Bernanke argued that the anchoring of inflation expectations prevented prices from falling by as much as the Phillips curve would predict. Lawrence Ball and Sandeep Mazumder and George Akerlof, William Dickens, and George Perry have argued that the Phillips curve is a poor model of the labor market, and that workers have not internalized the idea that prices for a given year less the previous year’s price have no effect on their wage expectations.

In my highly stylized model of how the labor market operates, companies and workers meet around the beginning of the year and bar- gain over wages for the coming 12 months. Both sides are concerned about real wages, but since neither one of the Phillips curves in the coming year would indicate — and the long-term unemployment rate rather than the overall rate. These results are consistent with the view that the long-term unemployed are on the margins of the labor market. Of course, others have presented alternative explanations for why inflation did not decline by very much during the Great Recession. Ben Bernanke argued that the anchoring of inflation expectations prevented prices from falling by as much as the Phillips curve would predict. Lawrence Ball and Sandeep Mazumder and George Akerlof, William Dickens, and George Perry have argued that the Phillips curve is a poor model of the labor market, and that workers have not internalized the idea that prices for a given year less the previous year’s price have no effect on their wage expectations.
years (Figure 10), suggesting that real wage growth has been consistent with the pace of improvement in the labor market as reflected by the decline in the short-term unemployment rate. Moreover, we continue to find a better fit with the short-term unemployment rate than the total unemployment rate, which is consistent with the long-term unemployed exerting less pressure on the job market.

Although the ECI presents the strongest picture in terms of wage growth, other measures of wages tell a similar story. For instance, the average hourly earnings of production and nonsupervisory workers from the BLS establishment survey also shows a pickup in real wage growth in the first half of 2015 consistent with the ECI and more.

Our work set off a cottage industry of research estimating the relationship of these Phillips curves. A number of economists, primarily in the Federal Reserve System, have recently produced analyses of Phillips curves using state-level data. The state-by-year level of analysis is often justified by the argument that national time series data do not provide sufficient variability to distinguish between the effects of short-term and long-term unemployment. I have found five such studies that analyze state-level wage growth. They yield a remarkably discordant picture of the relationship between wage growth and short-term and long-term unemployment. While some find that only short-term unemployment predicts wage growth, others find that both short-term and long-term unemployment are equally strong predictors. One theme that emerges, however, is that studies that utilize growth in the average wage, as opposed to the median wage, as the dependent variable tend to find that the short-term unemployment rate is a significantly stronger predictor of wage growth than is the long-term unemployment rate.

Given the disparity in these findings, I conducted my own investigation using a panel of state-level data from the CPS. My results were similar to those of Anil Kumar and Pia Orrenius at the Dallas Fed as well as Pat Higgins at the Atlanta Fed, who found that the short-term unemployment rate is a significant predictor of wage growth, while the long-term rate is not. Thus, my interpretation of these studies is that they are consistent with Phillips curve research using aggregate time series data. The short-term unemployment rate appears to be more meaningful than the long-term unemployment rate in the determination of average real wage growth at both the state and national level. It is unclear why, and whether, both measures of labor market slack predict median wage growth, but if one is interested in analyzing the relationship between slack and wage growth because of potential pass-through effects of factor costs on prices, then understanding the determinants of growth in the average wage is key.

The results — together with the low rate of job finding among the long-term unemployed and their relatively high labor force withdrawal rate — suggest that, if anything, the standard U-3 measure of the unemployment rate captures the degree of labor market tightness in the current environment. A variety of evidence points to the long-term unemployed exerting downward pressure on wages than do the short-term unemployed. They are increasingly likely to transition out of the labor force, which is a loss of potential for our economic recovery and, more importantly, a personal tragedy for millions of workers and their families.

Conclusion

To conclude, I will briefly comment on policies to address the problem of long-term unemployment. One of the overriding lessons that I take away from this body of research is that, if left untreated, long-term unemployment can have hysteresis effects on the labor market. A cyclical recovery does not cure the problems created by long-term unemployment. Going forward, I think one of the most important legacies of the Great Recession is that the labor force participation rate will be about one percentage point lower than it otherwise would have been. Workers argue in favor of using “overcompensating” force in a deep recession to prevent those who lose their jobs from becoming long-term unemployed in the first place.

Since long-term unemployment has been so widespread throughout sectors of the economy, “industry-specific” policies are insufficient to address the problem. In 2013, for example, only 10 percent of long-term unemployed workers were from the construction industry, and 11 percent were from manufacturing, despite the fact that these industries were hit particularly hard by the Great Recession.

Instead, I would prefer more targeted measures geared specifically toward helping the long-term unemployed stay in the labor force and find employment, such as a tax credit for employers who hire the long-term unemployed or direct employment. There also has been some research to support the notion that volunteering can help jobless workers make new connections, learn new skills, and stay engaged in the labor force. In the United States, job search assistance has typically been found to be effective in helping workers regain employment. I also think wage loss insurance might be worth considering, especially for older long-term unemployed workers.

Lastly, given that many of the long-term unemployed have already left the labor force, we should consider policies that address the structural decline in labor force participation. For example, more family-friendly policies might help greater numbers of women either enter or remain in the labor force. Likewise, reforms to the disability insurance system could possibly prevent some workers from permanently exiting the labor force.


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The Effects of Austerity: Recent Research

Alberto Alesina and Francesco Giavazzi

What are the costs in terms of output losses of so-called “austerity” policies designed to reduce large government deficits and mounting public debt? The debate on this issue is raging, especially after the latest round of austerity in Europe.

The question is difficult to answer for at least three reasons. The first is endogeneity, the two-way interaction between fiscal policy and output growth. Suppose you observe a reduction in the government deficit and an economic boom. It would be highly questionable to conclude that deficit reduction policies generated growth, since it could be easily the other way around. Second, major episodes of austerity are often accompanied by changes in other policies: monetary policy, exchange rate movements, labor market reforms, regulation or deregulation, changes in other policies: monetary policy, etc., we reconstructed actions taken at the time an austerity plan was adopted, announcements made at the time of adoption regarding future periods of up to three years, and revisions of these announcements in the actual policies then carried out.

To be more precise, a fiscal plan implemented at time t typically contains three components:

- Unexpected shifts in fiscal variables, announced upon implementation at time t
- Shifts implemented at time t but which had been announced in previous years
- Shocks announced at time t to be implemented in future years

Each year of a fiscal plan is fully characterized by these three components, which we allow to have different effects on macroeconomic variables.

To study the potentially heterogeneous effects of plans depending on their nature, we distinguish between Tax-Based (TB) and Expenditure-Based (EB) plans. A plan is labeled TB if the sum of output losses from tax-based approaches exceeds output losses from tax-based approaches.

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Research Summaries

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In the previously cited work with Carlo Favero, we address the third problem mentioned above, namely that fiscal adjustments are typically carried out through multi-year plans in which announcements and revisions deeply affect the expectations of economic agents. To begin, we checked the episodes of exogenous fiscal consolidations identified by Devries, et al, and corrected a few inconsistencies. More importantly, we constructed “plans.” By going back to the original sources (National Budget Reports, EU Stability Programs, IMF documents, OECD Economic Surveys, etc.), we reconstructed actions taken at the time an austerity plan was adopted, announcements made at the time of adoption regarding future periods of up to three years, and revisions of these announcements in the actual policies then carried out.

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Alberto Alesina is the Nathaniel Ropes Professor of Political Economy at Harvard University and director of the political Economics Program at the National Bureau of Economic Research. He is a member of the Center for Economic Policy Research, the Econometric Society, and the American Academy of Arts and Sciences.

Alesina has published five books, including The Future of Europe: Reform or Decline, with Francesco Giavazzi, and Fighting Poverty in the US and Europe: A World of Difference, with Edward Glaeser. He has been a co-editor of the Quarterly Journal of Economics for eight years and has published widely in all the major academic journals in economics.

He has written columns for leading newspapers around the world, and has visited at institutions including MIT, Tel Aviv University, Stockholm University, the World Bank, and the IMF. He holds a visiting position at IGIER, Bocconi University.

Born in Italy in 1957, Alesina obtained his Ph.D. from Harvard in 1986 and served as chairman of the department of economics there from 2003–06.

all the tax measures (unexpected, announced in the past and currently implemented, and announced at t for future implementation) measured as a fraction of year t GDP is greater than the sum of the corresponding expenditure measures.

As an example the Australian fiscal plan implemented between 1985 and 1988. The plan was announced in 1985 and consolidated last until 1988 with subsequent revisions of the original plan. The government announced a sequence of medium-term spending cuts aimed at reducing a large, inherited budget deficit. The initial plan featured no change in taxation and spending cuts of 0.45 percent of GDP in both 1985 and 1986. In 1986, the plan was revised. The new plan called for additional spending cuts of 0.4 percent of GDP to be implemented immediately, that is, in 1986; it also announced a further spending cut of 0.26 percent of GDP to be implemented in 1987 and a small reversal of -0.08 in 1988. Eventually, in 1987, this small spending reversal was abandoned and replaced by further cuts amounting to 0.37 percent of GDP. Revenue increase for 1986, the year of the plan's implementation, had a tax increase of 0.1 percent of GDP was implemented in 1986, while a further increase of 0.19 percent of GDP, and an almost complete reversal of -0.27, were announced for 1987 and 1988. In each of its four years, this plan is an "EB" plan because expenditure cuts exceed tax increases. In all years, fiscal variables remained unanticipated shifts in fiscal variables would ignore important information available both to firms and to consumers.

When studying fiscal plans, it is important to take into account the correlation between tax changes and spending cuts. Governments never decide the two components in isolation, but design the plan as a whole. For instance, a government may first decide it needs to implement an adjustment in tax by, say, 0.5 percent of GDP. The government may also decide that 0.5 percent of that adjustment will take place through spending cuts. Once this decision is adopted, tax increases are endogenous to the level of spending cuts. In all years, both tax and spending cuts were close to 50 percent, this is not the case here. The vast majority of plans in our estimation sample are far from 50-50. In only three plans is the share of spending cuts between 40 and 51 percent, and only in 15 is it between 45 and 55. The share of spending cuts in the average EB plan (in which the average total annual adjustment is 1.36 percent of GDP) is 84 percent, while in the case of TB plans (in which the average total annual adjustment is 0.89 percent of GDP) the share is 76 percent. In the estimated model, the effects of EB and TB adjustments are constrained to be the same across countries. We allow styles to differ across countries, and we allow for parameter differences between euro area and non-euro area countries.

Our main finding is that fiscal adjustments based upon cuts in spending are much less costly, in terms of output losses, than those based upon tax increases. Over our estimation period (1981–2007), the output effect of an EB tax adjustment plan with an initial size of one percent of GDP is a cumulative contraction in GDP of two to three percent in the following three years.10 In contrast, spending-based adjustments generate very small recessions, with an impact on output growth not significantly different from zero. As an example, Figure 1 shows the large differences between the effects of a one percent reduction of deficits implemented through an EB plan (in blue) and a TB plan (in black) in Canada. The effect on output growth of EB plans is indistinguishable from zero for about two years and then becomes significantly negative, while TB adjustments lead to deep recessions. The component of aggregate demand which seems to explain these differences in all countries, not only Canada, is investment, which is correlated with investor confidence. In our work with Favero, Barbiero, and Paradisi, we extend the dataset up to 2013 for the following countries: Austria, Belgium, Denmark, Spain, France, Germany, United Kingdom, Ireland, Italy, Portugal, and the United States.15 The effects of recent episodes of austerity do not look different from previous ones. Out-of-sample simulations of our model projecting our results on to only upon exogenous fiscal adjustments do reasonably well in predicting the total output fluctuations of the countries in our sample over the years 2010–13, particularly for those countries in which the main shock in that period was a fiscal policy one. For example, our estimates suggest that the tax-based adjustment implemented in Italy in 2010–13 is sufficient by itself to explain the recession experienced by the country over the period 2011–12, with negative GDP growth of around 2 percent in each year. The expenditure-based adjustments implemented in countries such as the U.K. and Denmark are associated with much milder recessions, with GDP growth fluctuating around zero.

We cannot reject the hypothesis that recent fiscal adjustments had the same effect on output growth although in some cases failure to reject is marginal. We do not find sufficient evidence to suggest that the recent rounds of fiscal adjustments have been especially costly for the economy, and we conclude that the fiscal multipliers estimated using data from the pre-crisis period give a more informative about the permanent output loss due to the post-crisis fiscal consolidation measures. This result is at odds with Blanchard and Leigh,28 who find that the costs of fiscal adjustment have been highly concentrated in the two years before and the one immediately following the fiscal adjustment.

We simulate out of sample the plans adopted by countries, we examine the effect of EB and TB plans on output, private consumption, investment, and consumer and investor confidence for 32 countries: Australia, Austria, Belgium, Canada, Denmark, Germany, Spain, France, United Kingdom, Ireland, Italy, Japan, Portugal, and the United States. In our sample, 84 plans are EB and 51 are TB. Although our model with the TB and EB dummies could be sensitive to the categorization of plans into EB and TB, in all years in which spending cuts are higher in government revenues to have identical parameter differences between euro area and non-euro area countries.
In current work in progress with Favero, Barbiero, and Paradisi, we take our analysis a step further by exploring the potential macroeconomic asymmetry in the output effects associated with different components of revenues and expenditure-side transfers. The fiscal shocks into four components: government consumption and investments, transfers, direct taxes and indirect taxes. From a theoretical point of view, each of these components should affect GDP growth through different channels. For instance, in the short run, cuts in government consumption and investment might impact GDP growth through demand-side effects; in the medium and long run, their effect on growth might depend on the government’s efficiency in providing public goods and services. Transfer cuts reduce the resources available to households, which in turn may be forced to cut consumption, especially if liquidity constrained. These measures also may have hysteresis effects by increasing labor supply. In addition, a reduction in both expenditure components may generate expectations of higher future taxes and thus reduce future economic distortions, with potentially positive wealth effects. The previous literature has addressed the issues of composition primarily by looking at revenues versus spending in the aggregate. Recent papers by Karel Mertens and Morten Ravn,15 Romer and Romer,17 and Roberto Perotti18 are exceptions. However, they focus only on the United States, and even in that country an international panel of disaggregated fiscal consolidation plans and analyzes their economic effects. Building on the methodology and the work with Favero, we classify fiscal plans into four categories: direct tax-based, indirect tax-based, consumption-based, and transfers-based.

Our first finding is that plans based on different spending and revenue components indeed have heterogeneous effects on GDP growth, as Figure 2 shows for the case of France. Results for the other countries are similar. While the heterogeneity in revenue components is less pronounced, on the expenditure side transfers seem to be clearly different from consumption and investment. The effect of a cut in transfers is more similar to that of an increase in taxation than to that of a cut in expenditure. Looking at other macroeconomic variables, the similarity between tax hikes and transfers cuts is particularly evident in the case of consumption and consumer confidence. The impact of a cut in transfers on investment is more similar to a cut in government consumption. The overall impact on output growth is more negative than that from a cut in government consumption, but less negative than a tax increase. Overall, our findings suggest that major fiscal adjustments based upon cuts in government consumption, excluding transfers, are much less costly than tax-based fiscal adjustments in terms of foregone output growth. In fact, cuts in government consumption seem to have virtually no costs in terms of output losses on average—a result which probably balances some recessionary and some expansionary cases. Tax-based fiscal adjustments are very costly in terms of output losses. Cuts in government transfers seem to lie somewhere between the extremes of government consumption and tax increases, though they are closer to tax hikes. Perhaps the smaller effect of transfers cuts relative to tax increases may have to do with a supply-side reallocation of resources targeted on this point. Regarding which tax increases are more costly, direct and indirect taxes seem to have overall similar effects, though this is also an issue to be explored further.

We also find that the differences in tax-based and expenditure-based fiscal adjustments cannot be explained by different responses of monetary policy, although the evidence points to a slightly more expansionary response of monetary policy in the case of expenditure-based adjustments, perhaps because tax-based adjustments tend to raise prices, while expenditure-based adjustments tend to lower them, or because central banks believe that expenditure-based adjustments are more long-lasting and credible. Our findings seem to hold for fiscal adjustments both before and after the financial crisis. We cannot reject the hypothesis that the effect of fiscal adjustments, especially in Europe in 2009–13, was indistinguishable from previous ones. They certainly show the same relative patterns between tax- and expenditure-based adjustments, per- centage increases are more costly, direct and indirect taxes seem to have overall similar effects, though this is also an issue to be explored further.

Corporate Liquidity Management

Murillo Campello

The global financial crisis drew fresh attention to the way firms manage liquidity, as credit markets dried up and internal savings became key to corporate survival. Liquidity management is an old topic; it has been discussed at least since John Maynard Keynes’ examinations in the 1930s. It attracts much attention today, as large companies worldwide have amassed some $4 trillion in “idle cash” on their balance sheets. Figure 1 depicts S&P 500 firms’ holdings of cash and liquid securities over the last 20 years. The holdings of liquid assets are the highest both in absolute values as well as a fraction of total corporate assets since at least WWII. Apple Inc., alone, recently reported holding nearly $180 billion in cash, enough to purchase the entire GDP of Portugal or Greece. Academic work on corporate liquidity took off around 2000. The notion of corporate cash levels to examine how firms handle their marginal savings has since evolved into the analysis of corporate liquidity. Firms that hold undrawn credit lines also hold some cash, but firms without the former do not hold significantly more cash. Credit line facilities, too, add up to trillions of dollars nowadays and the message one should take from this is that the availability of internal lines offsets that firms face in dealing with their liquidity needs. There should be less focus on observed cash balances per se, and more awareness that cash management is just one piece of a multifaceted process.

In joint work, Heitor Almeida, Michael Leibach, and I proposed looking beyond corporate cash levels to examine how firms handle their marginal savings decisions. We look at why firms may choose to save funds from operating cash flows, and which firms are likely to do so. We show that firms can engage in very active liquidity management processes independent of the level of cash shown on their balance sheets. We model and discuss a concept that we dub “the cash flow sensitivity of cash.” In essence, we isolate the fraction of incremental cash flows that firms retain as additional cash in each period. In our model, firms that are able to access cheaply-priced external funds (“financially unconstrained firms”) invest at first-best levels. As such, cash flow innovations have no effect on investment spending. Firms facing financial constraints, on the other hand, need to channel part of their cash flow into savings as a way to increase their ability to invest today and in the future. The fraction of cash flows that a firm retains will reflect management’s view as to whether the firm is able to successfully invest and capture investment opportunities and whether the capital markets will provide sufficient, fairly-priced financing for those investments. We show that the most efficient way to deal with financial constraints is by holding key differences between “savings” in the form of cash accumulation and in the form of built-up debt capacity. When facing financial constraints firms have built-up debt capacity even when they have enough internal cash to fund current investments. The reason is that if constrained firms’ future cash flows are low, they likely will be shut out of the credit markets, interrupting their investment plans. On the other hand, firms are able to continue their investment plans over time. Our theory is substantiated by empirical analysis showing that cash is not equivalent to “negative debt” for firms facing financial constraints. Cash uniquely allows constrained firms to maintain financing capacity across good and bad states of the world.

Alternative Forms of Liquidity

The foregoing work shows that cash creates financial flexibility because it ensures liquidity. Other forms of liquidity, however, allow firms to deal with key differences between their cash flow innovations have no effect on investment spending. Firms facing financial constraints, on the other hand, need to channel part of their cash flow into savings as a way to increase their ability to invest today and in the future. The fraction of cash flows that a firm retains will reflect management’s view as to whether the firm is able to successfully invest and capture investment opportunities and whether the capital markets will provide sufficient, fairly-priced financing for those investments. We show that the most efficient way to deal with financial constraints is by holding key differences between “savings” in the form of cash accumulation and in the form of built-up debt capacity. When facing financial constraints firms have built-up debt capacity even when they have enough internal cash to fund current investments. The reason is that if constrained firms’ future cash flows are low, they likely will be shut out of the credit markets, interrupting their investment plans. On the other hand, firms are able to continue their investment plans over time. Our theory is substantiated by empirical analysis showing that cash is not equivalent to “negative debt” for firms facing financial constraints. Cash uniquely allows constrained firms to maintain financing capacity across good and bad states of the world.

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Student Borrowing: Debt, Default, and Repayment
Lance Lochner

Three significant economic trends in the United States and other developed countries have altered the landscape of higher education substantially in recent decades, with important implications for student borrowing and repayment behavior. Alex Monge-Naranjo and I argue in a series of recent papers. First, the costs of college have increased markedly, even after accounting for inflation and expansions in student aid. Second, average returns to college (net of tuition payments) have increased sharply. Third, labor market uncertainty has increased considerably, highlighted by the Great Recession.

The first two trends, rising costs and returns to college, have contributed to a dramatic increase in demand for student loans. Annual student borrowing levels doubled in the 1990s and then again over the next decade. Combined government and private student debt levels in the U.S. quadrupled from $250 billion in 2003 to $1.1 trillion in 2013, reflecting sizeable increases in both the incidence of debt and debt levels among borrowers. Undergraduates turned more and more to private lenders to help finance their education prior to the 2008 increase in federal student loan limits and contemporaneous collapse in private credit markets. Undergraduate borrowing from non-federal sources peaked at 25 percent of all undergraduates borrowing. After the rise in private lending, there are concerns that a growing fraction of youth from low-income and even middle-income backgrounds are unable to access the resources they need to attend college.

At the same time, there are concerns that many recent students are taking on too much debt. Growing private and public student debt, coupled with rising labor market uncertainty and the last recession, have led to a sharp increase in the share of defaulting borrowers. Aggregate default rates after more than a decade of decline. Borrowers who are 270 days or more past due to pay their Stafford student loan payments are considerably more likely to default than borrowers who are on time with their payments. The share of defaulting borrowers has increased significantly since 2000.

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Lance Lochner is a research associate in NBER’s Labor Studies and Children Programs. He is a professor of economics, director of the Centre for Human Capital and Productivity, and Capital Markets Collapse: The Role of Liquidity When Capital Markets Collapse
The relation between corporate liquidity and real activity saw a dramatic downturn in 2007 and 2008, followed by a similar expansion. Financially constrained firms, in contrast, reported plans to resort to their bank credit facilities. Financially unconstrained firms used their cash reserves to buy back stock or invest in growth opportunities. The data for this analysis are drawn from the 2006-2008 NBER Financial Research Network survey of publicly traded firms.

Our results are consistent with the view that liquidity management is an important component of corporate finance. Financially constrained firms are more likely to hold cash and less likely to invest in new fixed assets. Financially unconstrained firms are more likely to invest in new fixed assets and less likely to hold cash. The evidence is consistent with the view that liquidity management is an important component of corporate finance.

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I thank Erasmo Giambona to help with the data collection and analysis. I also thank my co-authors and the editor and anonymous reviewers for their helpful comments.

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to compare the relationship between family income and college attendance between cohorts completing high school in the early 1980s and early 2000s. Consistent with previous studies, we estimate a weak relationship between family income and college-going for the earlier cohort. However, youth from high-income families in the later cohort are 16 percentage points more likely to attend college than their low-income counterparts, conditional on adolescent achievement and family background — roughly twice the gap observed for the earlier cohort. We further estimate that family income has become an important determinant of attendance at four-year (relative to two-year) colleges.

Uninsured labor market risk can discourage education in much the same way as credit constraints. Youth from low-income families may be unwilling to take on large debt to cover the costs of college when there is a possibility that they may not find good jobs after leaving school. By helping former students weather unexpected adverse labor market outcomes, explicit insurance mechanisms such as unemployment insurance or student loan deferments and implicit insurance mechanisms such as college saving plans or student loan programs can substantially affect the demand for credit and education.

Do Some Students Borrow Too Much?

An efficient student lending scheme should yield the same ex ante expected return from all borrowers even if ex post returns differ due to unpredictable labor market outcomes.
Determinants of Creativity and Innovation — Evidence from Economic History

Petra Moser

Innovation and creativity are the primary source of improvements in human welfare. Yet, due to two major empirical challenges, it is difficult to determine the factors that encourage creativity and innovation. First, modern settings often lack clean experimental variation, because policies designed to encourage innovation adapt in response to lobbying, which makes it difficult to identify causal effects. Second, innovation and creativity are exceedingly hard to measure. For example, patent counts are the standard measure of innovation, but they fail to capture important innovations that occur outside of the patent system, for example in countries without patent laws. Excluding such developments may distort economists’ views on the determinants of innovation.

My research addresses these identification and measurement challenges by exploiting a wealth of historical events that changed intellectual property laws and other policies independently of changes in innovation. In practice, this research approach combines in-depth analyses of historical records with statistical tests of large data sets. For example, I exploit a large amount of credibly exogenous variation in the creation of property rights in ideas that occurred in the 19th century — before interest groups had begun to lobby for their protection. For example, patent laws are continuously at risk of infringing on copyright protection, so patent laws and copyrights interact. My research investigates the effects of copyrights on Italian and British literature, as well as on music, science, and technology.

The main empirical challenge is to disentangle the effects of copyrights on innovation. My research addresses this challenge by exploiting exogenous variation in the creation of property rights in ideas. My research uses the Nazi’s decision to dismiss all Jewish scientists to examine the effects of copyrights on Italian opera.3

Does Existence of a Patent System Encourage Innovation?

My research addresses a central question in economic history: Has the creation of property rights in ideas encouraged innovation and economic growth? A strong tradition argues that secure property rights built the foundations for the industrial revolution in Britain and the United States.4 Innovation is, however, a cumulative process and strong property rights for early generations of inventors reduce payoffs for future generations.5 These costs are particularly severe if patents are broad and their boundaries uncertain, so that later generations are continuously at risk of infringing on existing patents. Recent patent laws over smart phones and tablet computers have moved these issues to the forefront of policy debates, but the underlying tensions are more general. My research exploits historical variation in 19th century patent laws — when countries such as Switzerland and the Netherlands had not yet adopted patent laws or had abolished them for political reasons — to investigate the effects of patent laws on innovation. To measure effects on innovation, I construct historical data sets to capture innovations that occur within and outside of the patent system.

My research exploits variation in the timing of Napoleon’s military victories to examine the effects of copyrights on Italian opera.3

My research uses the Nazi’s decision to dismiss all Jewish scientists to examine the effects of high-skilled immigrant scientists on U.S. innovation.6 Another project


major data constraint, I have used exhibition catalogues for the 1851 world technology fair in London and the 1876 U.S. Centennial Exhibition in Philadelphia to collect detailed historical information on nearly 20,000 innovations with and without patents, including their industries, locations, and whether they won a prize for being particularly innovative.

These data indicate that the existence of a national patent system may not be necessary to encourage innovation. In 1851, for example, Switzerland contributed twice as many exhibits per capita as the other European countries, and won a disproportionate number of prizes for being especially innovative, even though it had no patent system. Exhibition data show that only a small share of innovations were patented, calling into question the role of patents in encouraging the diffusion of innovations and workers. This suggests that innovation declined with the formation of the pool. Indeed, a portion of the data comes from an exogenous shift towards patenting can encourage the formation of the pool. Another alternative policy mechanism is compulsory licensing, which allows governments to license for- eign-owned patents to domestic firms without the consent of foreign patent owners. Emerging economies, such as India, Brazil, and Thailand have used this policy to improve access to HIV medications and other essential innovations for the benefit of domestic citizens. Because of its potentially significant implications for consumer welfare, compulsory licensing is one of the most controversial aspects of intellectual property policy today. Yet, there is almost no systematic, empirical evidence on the effects of compulsory licensing. My research with Alessandra Voena provides such evidence by exploiting an exogenous episode of compulsory licensing in 1918, when the United States decided to subject all enemy-owned patents to compulsory licensing. 

An analysis of historical patents suggests that U.S. invention increased by 31 percent in fields in which émigrés were active inventors. New inventor-level data indicate that émigrés encouraged U.S. invention by training younger scientists and by attracting U.S. scientists to research in émigrés’ fields. Can Copyrights Encourage Creativity? Another alternative policy mechanism is the copyright, which creates much narrower property rights than a patent and may thereby avoid many problems with the current patent system. A patent grants a monopoly on an invention for 20 years, whereas a copyright lasts for the life of the creator plus 70 years. Copyright law is typically enforced through civil and criminal actions, whereas patent infringement is enforced through courts and the Patent Office.

Along with intellectual property rights, science and immigration policies are critical levers that help determine innovation. Biographical evidence suggests that German Jewish scientists, particularly severe if pools increase the effectiveness of secrecy, created an exogenous shift towards patenting in chemicals without affecting other industries. I exploit this shift to examine historical data on the geographic location of innovations and workers. This analysis indicates that shifts toward patenting can encourage the diffusion, if not the adoption, of inventive activity.

In the 1930s, the premier science journal in the United States, the New York Journal of Science, required authors to assign their copyrights to the journal. This policy, which is the creation of a patent pool, in which firms combine patents for complementary parts of the same technology; pool members can then license all patents as a package to outside firms. In recent years, pools have formed across many technologies, ranging from tablet computers to diagnostic kits for breast cancer. Yet their effects on innovation are poorly understood. My research with Ryan Lampe uses the creation of the first patent pool in U.S. history, the Sewing Machine Combination (1856–77) to examine the effects of a pool on the creation of new technologies. An analysis of patents, firm entry, and quantitative measures for improvements in sewing speed suggests that the innovation declined with the formation of the pool. We also find that the creation of a pool can divert R&D towards inferior technologies that allow non-members to avoid direct competition with the pool. These effects are particularly severe if pools increase litigation risks for non-members or if they create a system of differential license fees that punishes non-members. Both of these traits are common features in modern pools. These findings are consistent with the large-scale analysis of 20 pools that formed under the New Deal.

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Japan Project Meeting

The NBER in collaboration with the Center for Advanced Research in Finance, the Center on Japanese Economy and Business, and the Australia-Japan Research Centre held a meeting on the Japanese economy in Tokyo, Japan on July 30–31. Shiro Armstrong, The NBER in collaboration with the Center for Advanced Research in Finance, the Center on Japanese Economy and Business, and the Australia-Japan Research Centre held a meeting on the Japanese economy in Tokyo, Japan on July 30–31. Shiro Armstrong, Yale University and NBER, organized the meeting. These papers were discussed:

- Anton Korinek, Johns Hopkins University and NBER, and Damian Sandri, International Monetary Fund, “Capital Controls or Macropredential Regulation?” (NBER Working Paper No. 20805)
- Javier Bianchi, University of Wisconsin–Madison and NBER; Chunxin Liu, University of Wisconsin–Madison; and Enrique G. Mendoza, University of Pennsylvania and NBER, “Phases of Global Liquidity, Fundamentals News, and the Design of Macropredential Policy”
- Luigi Guiso, Einaudi Institute for Economics and Finance; Helios Herrera, HEC Montréal; and Massimo Morelli, Columbia University and NBER, “Cultural Differences and Institutional Integration”
- Joel David, University of Southern California, and Ina Simonovska, University of California, Davis, and NBER, “Correlated Beliefs, Correlated Returns, and the Cross-Section of Stock Market Volatility”

Summaries of these papers are at: http://www.nber.org/confer/2015/ISOM15/summary.html

Program and Working Group Meetings

Economic Fluctuations and Growth

The NBER’s Program on Economic Fluctuations and Growth met in Cambridge on July 11. Research associates Giovanni Violante of New York University and Iván Werning of MIT organized the meeting. These papers were discussed:

- Gita Gopinath, Harvard University and NBER; Şebnem Kalemli-Özcan, University of Maryland and NBER; Loukas Karabarbounis, University of Chicago and NBER; and Carolina Villegas-Sanchez, Univesitat Ramon Llull, “Capital Allocation and Productivity in South Europe” (NBER Working Paper No. 21453)
- Gary B. Gorton, Yale University and NBER, and Guillermo Ordoñez, University of Pennsylvania and NBER, “Good Booms, Bad Booms”
- Marcus Hagedorn, University of Oslo, and Jesse Handbury and Iourii Manovskii, University of Pennsylvania and NBER, “Demand Stimulus, Inflation, and Marginal Costs: Empirical Evidence”
- Martin Beraja and Juan Ospina, University of Chicago, and Erik Hurst, University of Chicago and NBER, “The Aggregate Implications of Regional Business Cycles”

Summaries of these papers are at: http://www.nber.org/confer/2015/EFGs15/summary.html
The Changing Frontier: Rethinking Science and Innovation Policy

Edited by Adam B. Jaffe and Benjamin F. Jones
National Bureau of Economic Research Conference Report
Cloth: $110.00, e-book $88.00

In 1945, Vannevar Bush, founder of Raytheon and one-time engineering dean at MIT, delivered a report to the president of the United States that argued for the importance of public support for science, and the importance of science for the future of the nation. The report, Science: The Endless Frontier, set America on a path toward strong and well-funded institutions of science, creating an intellectual architecture that still defines scientific endeavor today.

In The Changing Frontier, Adam B. Jaffe and Benjamin F. Jones bring together a group of prominent scholars to consider the changes in science and innovation in the ensuing decades. The contributors take on such topics as changes in the organization of scientific research, the geography of innovation, modes of entrepreneurship, and the structure of research institutions and linkages between science and innovation. An important analysis of where science stands today, The Changing Frontier will be invaluable to practitioners and policy makers alike.

Enterprising America: Businesses, Banks, and Credit Markets in Historical Perspective

Edited by William J. Collins and Robert A. Margo
National Bureau of Economic Research Conference Report
Cloth: $110.00, e-book $88.00

The rise of America from a colonial outpost to one of the world’s most sophisticated and productive economies was facilitated by the establishment of a variety of economic enterprises pursued within the framework of laws and institutions that set the rules for their organization and operation.

To better understand the historical processes central to American economic development, Enterprising America brings together contributors who address the economic behavior of American firms and financial institutions — and the associated legal institutions that shaped their behavior — throughout the 19th and early 20th centuries. Collectively, the contributions provide an account of the ways in which businesses, banks, and credit markets promoted America’s extraordinary economic growth. Among the topics that emerge are the rise of incorporation and its connection to factory production in manufacturing, the organization and operation of large cotton plantations in comparison with factories, the regulation and governance of banks, the transportation revolution’s influence on bank stability and survival, and the emergence of long-distance credit in the context of an economy that was growing rapidly and becoming increasingly integrated across space.