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To: Distinguished Members of the Little Hoover Commission
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Re: January 25, 2018 Testimony

Good morning Chairman Nava and distinguished committee members. Thank you for the opportunity to comment on the important question of how new technologies such as artificial intelligence and robotics will shape the future of work in California.

Our country is beginning an important public discussion about the impact of new technology on work, one that is currently dominated by the perception that automation and its effects on employment are inevitable. Daily articles on the latest robots or algorithms cite often hyperbolic estimates of impending automation, while call-in radio shows field a stream of workers worried that their jobs will be made obsolete by artificial intelligence.

However, new research is suggesting that large-scale automation may not occur in the US in the near and medium term – especially if public policy acts to prioritize investments that support economic growth, job quality, and workforce transition. This represents a significant shift in the technology debate because it opens up a discussion about what role public policy and impacted communities should play shaping California’s future.

I believe that our collective task is to develop a transparent public policy framework for assessing the impact of emerging technologies, mitigating negative effects where they occur, and prioritizing innovation that truly contributes to the social good. Of particular importance will be to include the interests of workers and their communities – especially low-income communities and communities of color – in the development of that framework. A public policy response to new technologies need not be anti-innovation; automation and displacement are not the only path and our goal should be to leverage technology to build an economy that works for everyone.

In this testimony, I review the state of research on automation, discuss the importance of focusing on job quality in the technology debates, and identify key policy questions.

1. The state of automation research

While the robots scare continues to dominate popular media, the conversation in policy and research circles is beginning to move beyond the alarmist stage, especially this past fall. This shift has partly been driven by new research that is painting a more nuanced and balanced picture of the likely trajectory of future technological change and its effects on employment.

Here are four key insights that have come from these studies. I share them because I think they are substantively important for policymakers, community groups, workforce development providers, and other stakeholders.

- First is the critical distinction between jobs and tasks. The initial automation studies from several years ago focused only on jobs (yielding the [much-cited estimate](#) that 47 percent of jobs in the US could be automated). Recent studies, however, have argued that tasks are the more accurate unit of analysis, because each job is composed of many different tasks, some of which may be vulnerable to automation, others of which may not. Using this approach, predictions about job automation are much less dire, though many tasks may be vulnerable. For example, a January 2017 [McKinsey study](#) estimated that fewer than 5 percent of jobs in the US were at risk of automation, but that at least 60 percent of occupations have more than 30 percent of tasks that are automatable.
- The second advance is that there are two parts to analyzing the effect of technology: job loss and job creation. But to date, almost all of the focus has been on potential job loss. Only recently have researchers begun to focus on understanding potential sources of job creation and economic growth. For example, new technologies may increase productivity, which can lower prices and increase demand for products – thereby creating new jobs, which could offset job losses. Other sources of job creation are providing healthcare for an aging population and investments in infrastructure and new forms of energy. A November 2017 [McKinsey study](#) estimated that with sufficient public policy investments, job creation in the U.S. could offset automation-related job losses by 2030.
- Third, there is growing recognition that technical feasibility is not the same as actual adoption and implementation (many of the automation studies only assess the technical feasibility of automation, not the likelihood of actual technology adoption). A wide range of factors (economic, social, political, organizational) drive the scope and pace of technology adoption, which is often slower and less complete than one would predict based on feasibility alone. The lesson from past technological transformations is that public policy plays a significant role in determining the trajectory of adoption and impact.
- Fourth, all of the attention to date has been on automation. But new technologies have many other direct effects on tasks – deskilling or upskilling existing ones, creating new ones – as well as a slew of indirect effects, such as enabling outsourcing and changing the job matching process. These are all important effects for policymakers to understand. In particular, it is likely that incremental changes in task content and skill requirements will affect more workers in the coming years than large-scale automation events.

My read is that as a result of the above advances in research, we are seeing an emerging argument that large-scale automation may not occur in the US in the near and medium term – especially if, as McKinsey has argued, public policy acts to prioritize investments that support economic growth, innovation, job quality, and workforce transition. This represents a significant shift in the robots debates because it introduces agency; the idea that public policy and impacted communities can affect the speed, direction, and outcomes of technological change.

I don't want to overstate the point. We are dealing with enormous amounts of uncertainty in trying to chart the future, and in particular, engineers argue that we are only at the beginning of an explosion in progress on artificial intelligence and robotics. At the same time, they counsel caution: humans tend to overestimate the impact of technology in the short term and underestimate it in the long term.

The upshot for policymakers is that responding to oncoming technological change will not involve traditional data-driven policymaking. Researchers are working hard to generate informed scenarios about the future (and there is more research to be done, especially at the industry level). But it is

unavoidable that policymakers will need to figure out both short-term and longer-term responses in the context of considerable uncertainty.

2. The intersection of new technology and job quality

If all-out automation is unlikely any time soon, then what are other important policy questions about technology and the future of work? Economists are sounding the alarm that technological change [may exacerbate](#) the already high levels of inequality in the U.S. New technologies are likely to have significant effects on the quality of existing and new jobs (wages, benefits, hours, the employment relationship, worker voice) as well as the distribution of jobs (by race, gender, immigration status, education level, geography). Only focusing on automation means that we may miss important opportunities to intervene and prevent further economic polarization and widening race-based inequality in the U.S. Here are three examples coming out of ongoing research that highlight some of these dynamics:

Autonomous trucks

The popular press is replete with predictions that autonomous trucks will displace millions of truck drivers, leaving them ill-fitted for re-employment in the new economy. But in-depth field research that we commissioned is painting a more nuanced picture. First, not all long-distance truck drivers are vulnerable. Many skilled truckers who haul specialized freight and make deliveries of small shipments are not likely to lose their jobs to autonomous trucks in the foreseeable future. Second, there are very likely to be significant new job opportunities in short-distance truck driving in urban areas (which is much harder to automate): the continued explosion in on-line retail means the growth in fulfillment centers and the need for truck drivers to move goods between warehouses, and from warehouses to customers.

The question is whether those jobs will be good jobs. One scenario is that employers will default to a gig model – independent contractors using their own trucks and getting package delivery gigs via an app, likely at low wages. But this outcome is not inevitable, and so the challenge for policymakers is to identify strategies to incentivize the creation of good jobs in this fast growing occupation.

New food retail channels

The future of the grocery industry is the topic of significant debate. Some analysts argue that we will see mass automation of grocery check-out clerks. Others are skeptical, noting that predictions of displacement have been prominent since the late 1990s, with little impact so far. However, research that we are commissioning is focused on a different trend: new distribution channels that could shift how and where customers shop for food. Examples of new channels include third party delivery, direct sale and delivery, and meal-kit delivery.

If any or all of these channels prove viable and therefore employ more food retail jobs (and this is an open question), the impact on job quality could be significant. Grocery stores are still unionized in big cities and have career ladders leading to living wage jobs. By contrast, job quality tends to be low in these new channels. In 2016, investigative reporting of a meal-kit delivery company uncovered a large packaging warehouse with routine health and safety violations and reliance on temp agencies (with a workforce that was largely workers of color). Again, the question for policymakers is what tools are available to ensure good job standards in these new industry segments.

Equity in the future California labor market

An emerging and vital question is how the effects of new technologies will differ by race, gender, and immigration status. This is actually a multi-layered question. First, consider employment in occupations at risk of automation/displacement. This is the most obvious threat to the goal of equity: that workers of color, immigrant workers, and women are dependent upon the type of routine/manual occupations that are at [high risk](#) of automation, or at risk of significant upskilling (requiring more education) or deskilling (resulting in lower wages).

But second, it is also important to identify technology's effects on jobs [higher up](#) in career ladders typically accessed by low-wage workers, women, and workers of color. A good example is para-technical jobs in hospitals, which are often good jobs accessible to workers without college degrees. Some of these jobs may be susceptible to automation or significant transformation (lab tech, radiology tech), which would affect the stability of those career ladders. And third, there is growing focus on algorithms used in hiring, monitoring/performance evaluation, scheduling, etc. We are just now beginning to see experimentation with these algorithms in the workplace, but it is clear that there is [significant potential](#) for discriminatory outcomes (in some cases these have already been documented).

3. Public policy options

Once we move beyond treating automation as inevitable, a wide range of questions arises. What would a 21st Century education and training system look like, one that directly involves employers and workers in the adoption and implementation of new technologies? How do we ensure the creation of good jobs that can support working families, rather than the race to the bottom that currently characterizes a lot of new industries? How do we leverage technology to reduce, rather than exacerbate, economic inequality and race and gender bias? What is the responsibility of employers in answering these questions – and in particular, what is the role of the tech sector? Ultimately, how should we govern technology to ensure equitable outcomes and shared prosperity for all of our communities?

As part of the Labor Center's work, we are starting to map out a wide range of policy options. Here is an initial sketch of major areas we are researching:

- *Displacement policy:* While the U.S. is unlikely to see large net employment losses in the near term, automation will cause some workers to lose their jobs, and realistically, not all of them will be young or healthy enough for re-training. Possible policy models include early warning requirements on impending introduction of automating technologies; compensation or early retirement for workers displaced by automation; or incentives to offer displaced incumbent workers other jobs with the same employer.
- *Worker education and re-training:* Technological change and the need to continuously train and retrain workers presents a [profound challenge](#) to our country's workforce development system. Robust education, training, and job placement will need to be directly linked to good jobs, with a focus on ensuring equity. In particular, employer investment in on-the-job training retraining should play a central role, tied to incumbent worker retention where possible.
- *Labor market & product market policy:* Labor standards on new jobs, and existing jobs transformed by technology, should be a key focus of policymakers (and this should include setting strong labor standards for independent contractors). Product-market oversight of new

technology products and industries also has the potential to significantly affect job quality; examples include product safety and liability, algorithmic bias/workplace monitoring, and data ownership policy.

- *Job creation policy:* A growing chorus of experts is arguing for a “Marshall Plan” of public investments in [physical infrastructure](#) (transportation, energy) and social infrastructure (health care, child care, education) to ensure continued economic growth. Especially important is that public policy focus on improving job quality in the fast-growing care sector. For example, home care and child care are currently some of the worst-paid occupations in the U.S. economy, and yet are routinely identified as occupations that will be able to absorb workers displaced by automation.
- *Revenue generation:* Clearly many of these policy options will require revenue and there is no shortage of ideas being generated (robots taxes, fees on technology patents and licenses, financial transaction taxes, and so forth).
- *Innovation policy:* A more aspirational goal would be to explore a proactive innovation policy that would leverage public funding to shape the incentives and goals of technological development, and the inclusion of civic actors via, for example, multi-stakeholder partnerships (as is currently being done in some European countries).

A final note that developing a public policy response to new technologies invariably will involve evaluating and weighing different approaches, including an assessment of costs and benefits. But we currently do not have good tools for that assessment. A key task therefore is to develop tools that allow a full and broad evaluation of the economic effects of new technologies, beyond the narrow focus on increased efficiency.

* This policy inventory is starting with near- and mid-term responses, and so we are not yet including long-term proposals such as universal basic income or social wealth funds.