

Adapting to Climate Change: What are the Challenges and Opportunities for the U.S. Business Community?

By
Margo Thorning, Ph.D.
Senior Vice President and Chief Economist
American Council for Capital Formation
Before the
Committee on Environment and Public Works
U.S. Senate

August 1, 2012

Executive Summary

Current Climate Models Produce Conflicting Results: The wide variation in temperature, rainfall and other measures predicted by the various climate models makes it difficult for both policymakers and the private sector to decide when and how much capital to invest in measures to adapt to possible changes in the climate. Business investments are judged on the basis of their costs and benefits so until climate models show more convergence, the business community will have difficulty in justifying adaptation policies beyond “no regrets” (or those that would be undertaken anyway in the normal course of business).

Most Businesses Do Not Plan Investments over Long Time Horizons: Many climate models do not predict significant global warming for at least another 50 to 100 years; their simulations commonly extend to the year 2100. Most businesses however, plan investments over a 3 to 15 year horizon, not 50 to 100 years. Thus, business is more likely to engage in “no regrets” strategies to address adaptation to climate variability rather than undertake substantial investments in anticipation of changes in climate that may only occur in 50 to 100 years.

Barriers to Investment Caused by Regulatory and Permitting Delays: Conflicting regulations, regulatory uncertainty and permitting delays are often factors hindering U.S. companies from making investments to improve or expand their facilities in order to adapt to extreme weather events or climate variability. For example, in addition to permits to meet federal regulations there are often additional state and local permit requirements which add time and cost to a project getting underway. EPA regulation of GHGs under the Clean Air Act is an example of regulatory uncertainty that is likely to be slowing not only adaptation but also U.S. investment and job growth.

Opportunities for Business to Adapt to Potential Climate Variation: U.S. companies have already begun to adopt “no regrets” strategies to adapt to climate change. For example, some utilities are “hardening” their infrastructure to reduce damage from future weather events and agriculture and the insurance industry are also developing technologies and policies to adapt to climate change.

Financing Adaptation Will Depend on Strong Economic Growth: Sound fiscal policies and a tax code that retains robust capital cost recovery rules can enhance growth. Further serious consideration should be given to a consumed income tax in which all saving is deducted and all investment is expensed. Regulatory reform and reducing permitting delays will also enhance growth .

Adapting to Climate Change: What are the Challenges and Opportunities for the U.S. Business Community?

By
Margo Thorning, Ph.D.
Senior Vice President and Chief Economist
American Council for Capital Formation
Before the
Committee on Environment and Public Works
U.S. Senate

August 1, 2012

Introduction

Chairman Boxer, Ranking Member Inhofe and members of the Committee, my name is Margo Thorning, senior vice president and chief economist, American Council for Capital Formation (ACCF),* Washington, D.C. I am pleased to submit this testimony on challenges faced by the private sector in adapting to both near and long term variations in climate.

The American Council for Capital Formation represents a broad cross-section of the American business community, including the manufacturing and financial sectors, Fortune 500 companies and smaller firms, investors, and associations from all sectors of the economy. Our distinguished board of directors includes cabinet members of prior Democratic and Republican administrations, former members of Congress, prominent business leaders, and public finance and environmental policy experts. The ACCF is celebrating over 30 years of leadership in advocating tax, regulatory, environmental, and trade policies to increase U.S. saving, investment and job growth.

Background

Adapting to changes in the climate has been a feature of life for the ecosystem including humans, animals and plants for millions of years. In recent years, increased concentrations of greenhouse gases (GHGs) in the atmosphere have raised concerns that the earth's temperature may warm to levels which will cause increased extreme weather events, decreased rainfall, rising sea levels, more rapid loss of species and other changes that would cause economic and environmental damages. My testimony focuses on the economic and financial issues that need to be understood

**Founded in 1973, the American Council for Capital Formation is a nonprofit, nonpartisan organization advocating tax, energy, regulatory and environmental policies that facilitate saving, investment, economic growth and job creation. For more information about the Council or for copies of this testimony, please contact the ACCF, 1750 K Street, N.W., Suite 400, Washington, D.C. 20006-2302; telephone: 202.293.5811; fax: 202.785.8165; e-mail: info@accf.org; website: www.accf.org*

and addressed in order for the U.S. business sector to begin to address the risks that may arise if global temperatures rise significantly in the future.

Challenges for Business in Adapting to Potential Climate Change

- **Current Climate Models Produce Conflicting Results**

The wide variation in temperature, rainfall and other measures predicted by the various climate models makes it difficult for both policymakers and the private sector to decide when and how much capital to invest in measures to adapt to possible changes in the climate. Several factors make climate modeling challenging: (1) uncertainty about emissions trajectories, (2) uncertainty about how the climate responds to changes in GHGs in the atmosphere and (3) natural climate variability due to factors such as solar activity and volcanic eruptions. A recent presentation by Professor Jouni Raisanen of the University of Helsinki highlights the extreme variation in temperature predictions produced by modeling 7 simulations using 22 different climate models.¹ As shown in Figure 1, the temperature changes predicted by 2069 to 2098 range from 1 to 7 C. Furthermore, absolute differences in the various models' predictions for changes in temperature and precipitation increase with the passage of time (see Figure 2). In addition, the models are not granular enough to even allow a reliable estimate of the impacts on southern compared to northern Texas so it is difficult for a company to know what to react to. Business investments are judged on the basis of their costs and benefits and therefore until climate models show more convergence, the business community will have difficulty in justifying adaptation policies and investments beyond "no regrets" steps (or those that would be undertaken anyway in the normal course of business).

- **Many Businesses Do Not Plan Investments over Long Time Horizons**

Many climate models do not predict significant global warming for at least another 50 to 100 years; their simulations commonly extend to the year 2100. Most businesses however, plan investments over a 3 to 15 year horizon, not 50 to 100 years. As noted by David Cotts and Edmond Rondeau in *The Facility Manager's Guide to Finance and Budgeting*, "few firm's strategic plans extend beyond ten years and many are capped at five."²

Further, a recent OECD report, *Private Sector Engagement in Adaptation to Climate Change* states that:

"Risk assessments vary based on companies' capabilities and priorities – some countries use dedicated tools to assess climate risks while others broaden the scope of existing risk management procedures to include climate change. The incorporation of longer time frames into risk assessments to capture long-term climate change risks is not yet common. The possible increase in frequency and intensity of extreme events is often the

¹ http://www.baltex-research.eu/ecosupport/events/uncertainty_workshop_2010/Jouni_Raisanen.pdf

²

http://books.google.com/books?id=IbPM1O4WrWIC&pg=PA47&lpg=PA47&dq=business+planning,+how+far+out+to+plan,+industry,+10+years&source=bl&ots=xX9a7_Flm1&sig=IEbP6ViSm-rW-sX2f7OwV4_3MT0&hl=en&sa=X&ei=9ZEWUPqjJOXn0gH14oCwCA&ved=0CF4Q6AEwAQ#v=onepage&q=business%20planning%2C%20how%20far%20out%20to%20plan%2C%20industry%2C%2010%20years&f=false

main focus of risk assessments, and companies are generally more concerned about direct impacts than about indirect impacts.”³

It seems likely that in the absence of clear evidence about the scale and timing of damage from climate variability, companies will continue to wait to make major investments until after a significant event such as a storm or flood occurs. In addition, the rapid change in business conditions, technology and global competition in recent years makes businesses cautious about making assumptions about the future profitability of investments. Thus, business is more likely to engage in “no regrets” strategies to address adaptation to climate variability rather than undertake substantial investments in anticipation of changes in climate that may only occur in 50 to 100 years.

- **Barriers to Investment Caused by Regulatory and Permitting Delays**

Conflicting regulations, regulatory uncertainty and permitting delays are often factors hindering U.S. companies from making investments to improve or expand their facilities in order to adapt to extreme weather events or climate variability. For example, in addition to permits to meet federal regulations there are often additional state and local permit requirements which add time and cost to a project getting underway.

An example of a regulation that is likely to be slowing U.S. investment for maintenance and expansion as well as for “no regrets” and “hard” investments to adapt to climate change is the U.S. Environmental Protection Agency’s regulation of U.S. greenhouse gas emissions under the Clean Air Act (CAA). EPA began requiring regulated stationary sources with emissions over a specified emissions threshold to obtain permits under the Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs in 2011. The PSD program requires that new and modified facilities of entities such as power plants, industrial and commercial boilers, iron and steel producers, refineries, cement and pulp and paper producers having the potential to emit greenhouse gases above a certain level must obtain a preconstruction air quality permit. The Title V program requires sources having the potential to emit air pollutants above a certain amount to obtain an operating permit. In order to obtain a PSD permit, regulated emitters will have to put in place “Best Available Control Technology” (BACT). In November 2010, EPA released general guidelines for selecting BACT; the selection will be done on a case-by-case basis. Unfortunately the BACT guidelines are not likely to materially reduce the uncertainty facing regulated entities planning capital investments or improvements and thus the factors that impact the cost of capital and investment hurdle rates will continue to impede the U.S. economic recovery.

As a result of the uncertainty caused by EPA’s GHG regulations, investment is estimated to decline by 5% to 15 % in directly impacted industries, such as the electric power sector, mining, manufacturing and wholesale and retail trade which were responsible of 25% of overall capital investment in U.S. economy in both 2008 and 2009. A 5% to 15% decline in investment for only the directly affected industries would result in an approximately \$25 to \$75 billion reduction in investment outlays and could result in between 476,000 to 1.4 million fewer jobs in 2014

³ <http://www.oecd-ilibrary.org/docserver/download/fulltext/5kg221jkf1g7.pdf?expires=1343662341&id=id&accname=guest&checksum=AB5A1E60DAE2A2CF7BF18F5E957CD1E8>

compared to the baseline forecast.⁴ In addition, GDP would be \$47 billion to \$141 billion less in 2014 than compared to the baseline forecast.⁵

Another example of U.S. regulatory and permitting policies delaying new investment which could help business reduce emissions as well as adapt to climate change is found in recent testimony by Hal Quinn of the National Mining Association. He notes that slow permitting is hindering investment in domestic rare earth mines.⁶ (Rare earth minerals have many industrial uses including for catalytic converters and in the nickel-metal hydride batteries used in hybrid cars). Quinn states that the United States Geological Survey recently reviewed permit times for U.S. metal mines and found that “The time to obtain a permit has required as many as 17 years and one mine the Pogo, Alaska gold mine, was developed under an expedited permitting schedule that still took 7 years.”⁷

The interim report of the President’s Council on Jobs and Competitiveness also recognizes the role that U.S. regulations and permitting delays play in delaying or preventing new investment. The report’s policy recommendations include: (1) requiring agencies to develop a template for online permit tracking for federal permitting and environmental review, (2) requiring agencies to seek early stakeholder engagement and holding agencies accountable for meeting permitting milestones, (3) limiting duplication among local, state and federal agency reviews and (4) improved up-front processes in permit approvals that could be helpful in litigation management.⁸

Opportunities for Business to Adapt to Potential Climate Variation

- **“No Regrets” Planning for Adaptation**

The OECD report cited carried out 16 case studies on a variety of companies in different industries regarding their policies and plans for adapting to climate change. Many focus on direct and immediate impacts that may already be evident, such as more frequent and violent natural hazards, rather than more distant and uncertain systemic risks.⁹

The case studies also reveal that companies’ engagement in implementing risk management measures varies. Having assessed climate change impacts on their business operations, some companies may decide not to implement adaptation measures, or to delay implementation. This can be part of an efficient adaptation strategy if the expected benefits of those measures are outweighed by the costs on a present value basis.

Two third of the companies in the OECD survey have implemented “no regret” activities that can be classified as adaptation, but which they would have implemented in any case for other purposes. These measures usually deal with current climate variability and current environmental

⁴ <http://accf.org/wp-content/uploads/2011/02/House-Energy-Commerce-Testimony-292011-FINAL.pdf>

⁵ Ibid., p. 5.

⁶ http://www.nma.org/pdf/cong_test/042612_quinn.pdf

⁷ Ibid., p.3.

⁸ http://files.jobs-council.com/jobscouncil/files/2011/10/Jobscouncil_InterimReport_Oct11.pdf

⁹ Ibid., p. 28.

concerns, or are measures that are beneficial to the companies' business operations while also making them more resilient to climate change impacts. Examples of such synergistic measures can be found in several industry sectors and typically address issues of water scarcity, sustainable agriculture, the climate resilience of suppliers and sources of raw materials for production, and market-driven changes in customer demand.¹⁰

- **Going Beyond “No Regrets” with Climate Preparedness**

While not yet widespread, some companies in the U.S. are moving beyond “no regrets” policies by planning for climate change as well as investing in “hard adaptation” measures. As the OECD report explains, hard measures include specific technological and infrastructural changes involving capital goods that consider specific climate change risks in planning and design. The selection of specific measures will depend on the extent and type of changes that the company has to make in order to be climate proofed.

For example, as a result of damage from Hurricanes Rita and Katrina and awareness of climate risk to the Gulf Coast, a major utility company, Entergy Corporation has begun a \$74 million dollar project to relocate and harden transmission and distribution lines serving Port Fourchon, Louisiana which is the single largest point of entry for crude oil coming into the U.S.¹¹

Similarly, the agriculture industry is also beginning to plan for the possibility of a warmer world as well as for the expected 30 % increase in food production needed by 2050 to feed the world's growing population. Some regions and crops could do better, thanks to a longer growing season and higher levels of CO₂ in the air, and others could suffer. Seed companies have renewed their efforts to develop drought resistant crops, according to John Soper, director of product development at Pioneer, a unit of DuPont.

“We’re expecting some drier weather to move into the key corn growing areas,” he said. “The climate in Illinois might be more like the climate in Arkansas.” Pioneer is testing drought-resistant corn and other crops in desert-like test fields in California and Chile, he said, in part because farmers who now irrigate their fields are already telling Pioneer that they expect limits on the availability of water. In India, Pioneer is working to develop drought-tolerant varieties of rice, which is now grown on flooded land but may have to adapt to a drier climate. Other seed companies including Monsanto, Syngenta and Bayer Crop Science are working on their own drought-resistant crops.¹²

The insurance industry is also recognizing that more extreme weather events may occur in the future. Insurance, which is society's traditional risk management tool, will have a role to play in addressing the impacts of floods, hurricanes, fires, tornados or other events. As a recent report by Zurich Financial Services Group notes, insurers have the tools to play a significant role in widespread adaptation to the possible risks resulting from climate change. For example, insurers have had success in supporting the deployment of building code requirements and new technologies. Insurers could again play that role in facilitating adaptation to climate change risk

¹⁰ Ibid., p.29.

¹¹ <http://www.marcgunther.com/2012/01/22/climate-change-its-time-to-get-ready/>

¹² Ibid.

– through coverage provisions related to resilience of building stock and infrastructure to extreme weather events.¹³

Strong Economic Growth Can Facilitate Adaptation to Climate Change

Adapting to variations in the climate will be easier for countries that whose economies are growing and for businesses and consumers which are prospering. In order to finance both “no regrets” investments as well as hard adaptations to climate variability businesses will need strong portfolios and growing assets. Among the policy options that should be considered to enhance U.S. economic growth are tax reform. In addition, as discussed above, reducing regulatory and permitting barriers to new investment will also promote a stronger economy.

- **Tax Policy to promote U.S. investment and economic growth**

As policymakers debate tax reform, they need to consider how important cash flow is for new U.S. investment. New academic research provides evidence of the strong link between investment and cash flow; a dollar of current and prior-year cash flow is associated with \$0.32 of additional investment for firms that are least likely to face difficulty in raising money in capital markets and with \$0.63 of new investment for firms likely to face constraints. These results have implications for U.S. investment and job growth since ACCF research shows that each \$1 billion in new investment is associated with an additional 23,300 jobs (see Table 1).¹⁴

Some tax reform plans such as Bowles/Simpson trade accelerated and bonus depreciation for a lower corporate income tax rate. If these provisions are repealed and replaced with economic depreciation which is generally longer than the current Modified Accelerated Cost Recovery System (MACRS), the cost of capital for new equipment will rise and investment is likely to decline. The benefit of MACRS and bonus depreciation is its positive impact on cash flow, which occurs immediately as the investment is put in place. If, as seems likely, higher hurdle rates were to cause U. S. investment in equipment (which averaged \$1.1 trillion in 2011) to decline, there would be a significant negative impact on employment and economic growth.

Instead of making some segments of the business community better off at the expense of others by eliminating tax provisions such as accelerated and bonus depreciation or LIFO in order to “pay for” lower corporate tax rates, under any tax reform policymakers should retain or enhance capital cost recovery rules in order to promote new investment and economic growth. Better still, they should consider a consumed income tax in which all saving is deducted and all investment is expensed. Dr. Allen Sinai, president and chief global economist of Decision Economics, used his large scale macroeconomic model to simulate the impact of a consumed income tax compared to the federal tax code in effect in 2001. The simulation modeled a system in which all saving is tax exempt, all new investment is written off in the first year, and interest expense for business and individuals is not tax deductible. The consumed income tax simulation shows strong increases in GDP, investment, employment, and federal tax receipts compared to the baseline forecast. If the consumed income tax system had been in place starting in 1991,

¹³ <http://www.zurich.com/sitecollectiondocuments/insight/climateriskchallenge.pdf>

¹⁴ <http://accf.org/wp-content/uploads/2012/07/ACCF-Testimony-7-27-2012-FINAL1.pdf>

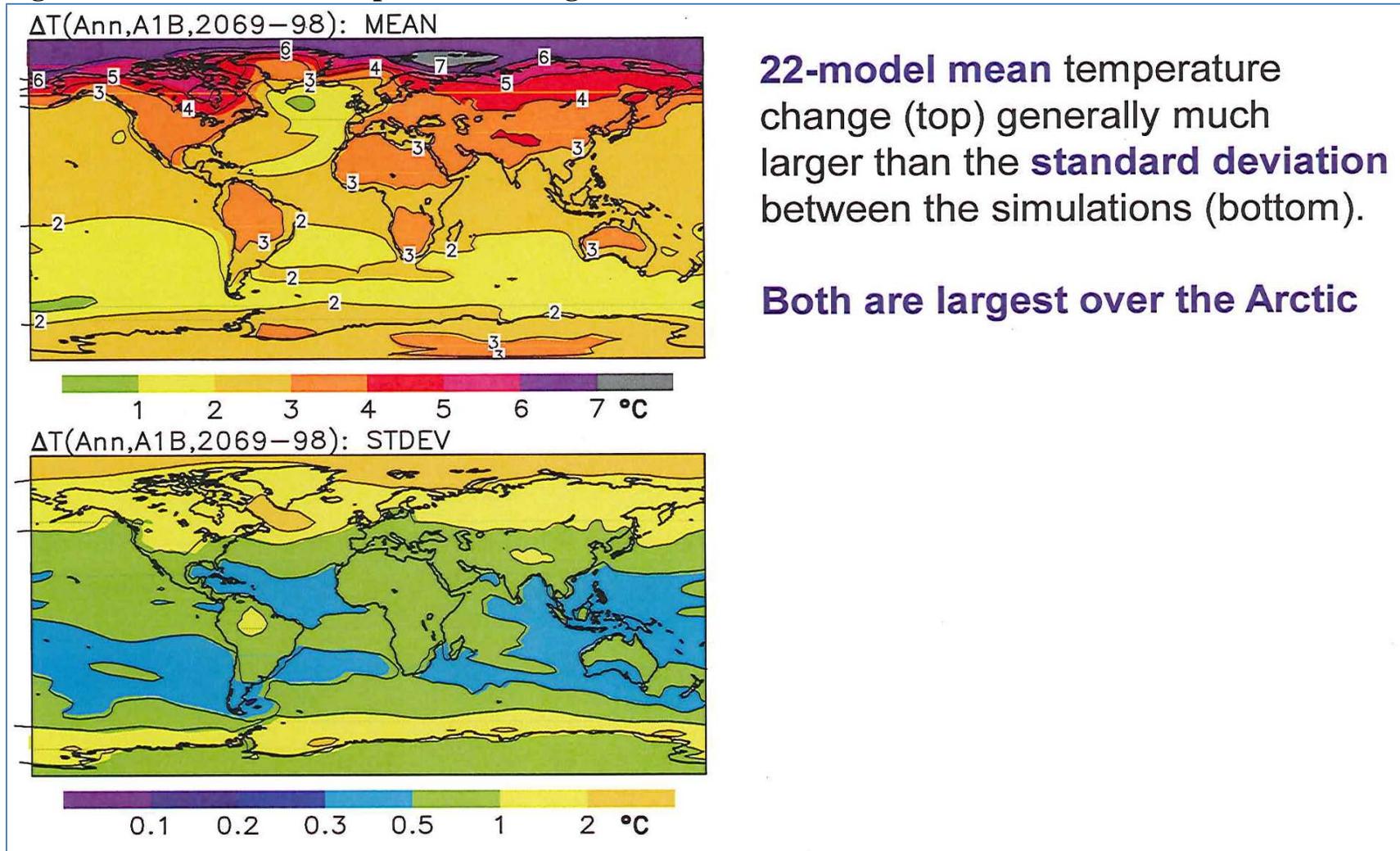
GDP would have been 5.2 percent higher, consumption and investment would have been greater, and employment higher by over 140,000 jobs per year by 2001 (see Table 1). In addition, federal tax receipts would have been \$428.5 billion larger in 2001 compared to the baseline forecast. ¹⁵

Conclusions

Climate models are still in the development stage and the various models yield significantly different predictions about future temperature and precipitation. Accordingly, for companies which rely on cost/benefit analysis to guide their investment decisions, a policy of “no regrets” will continue to shape their approach to adaptation to climate change. In addition, adapting to variations in the climate will be much easier for countries and businesses which have the resources to invest in new technology, new products and innovations across all sectors. Strong U.S. economic growth can be promoted through sound fiscal policies and a tax code that promotes economic growth with robust capital cost recovery rules. Further, serious consideration should be given to replacing the current income tax system with a consumed income tax which is favorable to saving and investment. Reducing regulatory and permitting barriers will also help restore much needed investment across all sectors.

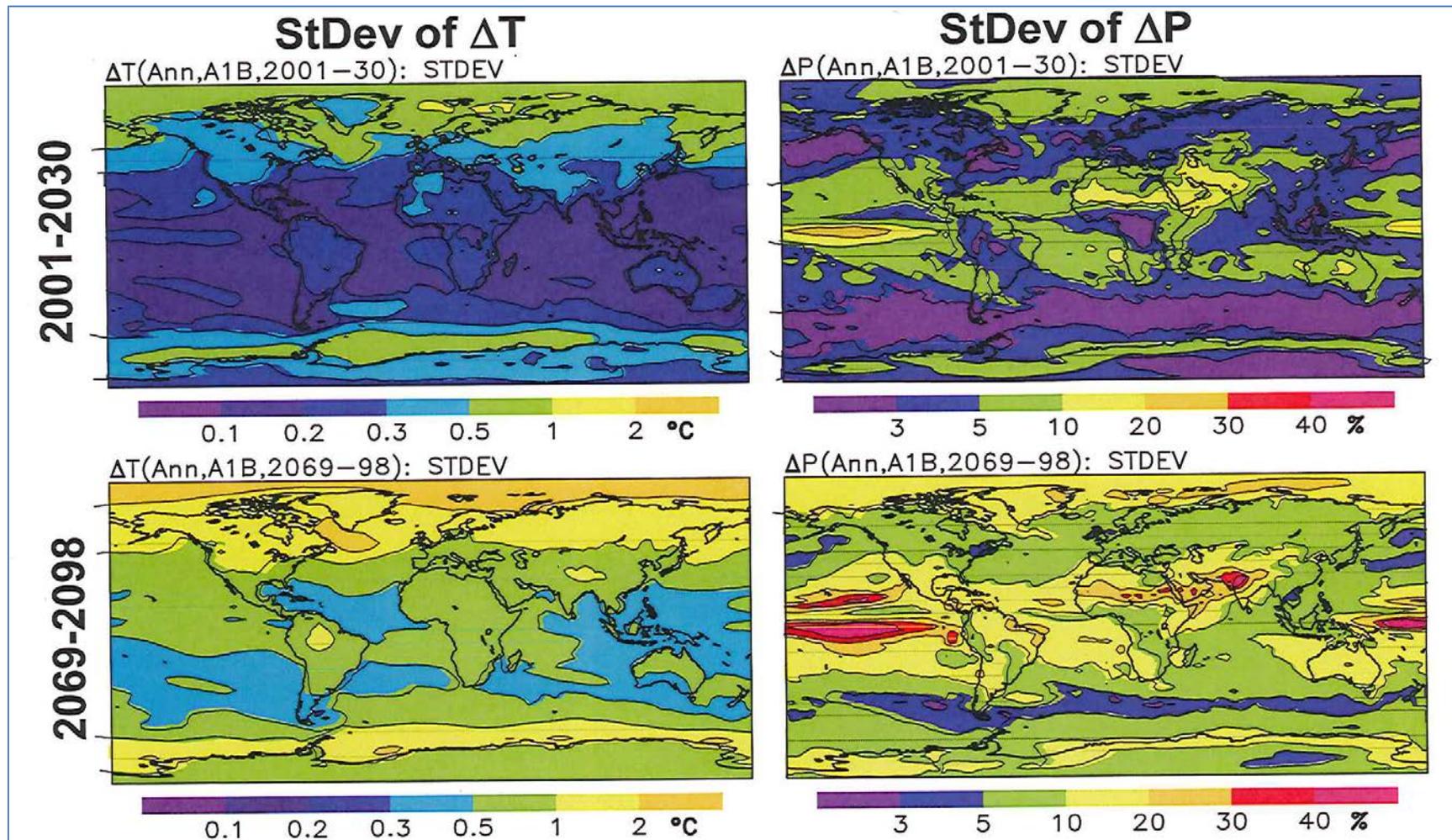
¹⁵ Ibid.

Figure 1. Annual Mean Temperature Change from 1971-2000 to 2069-2098



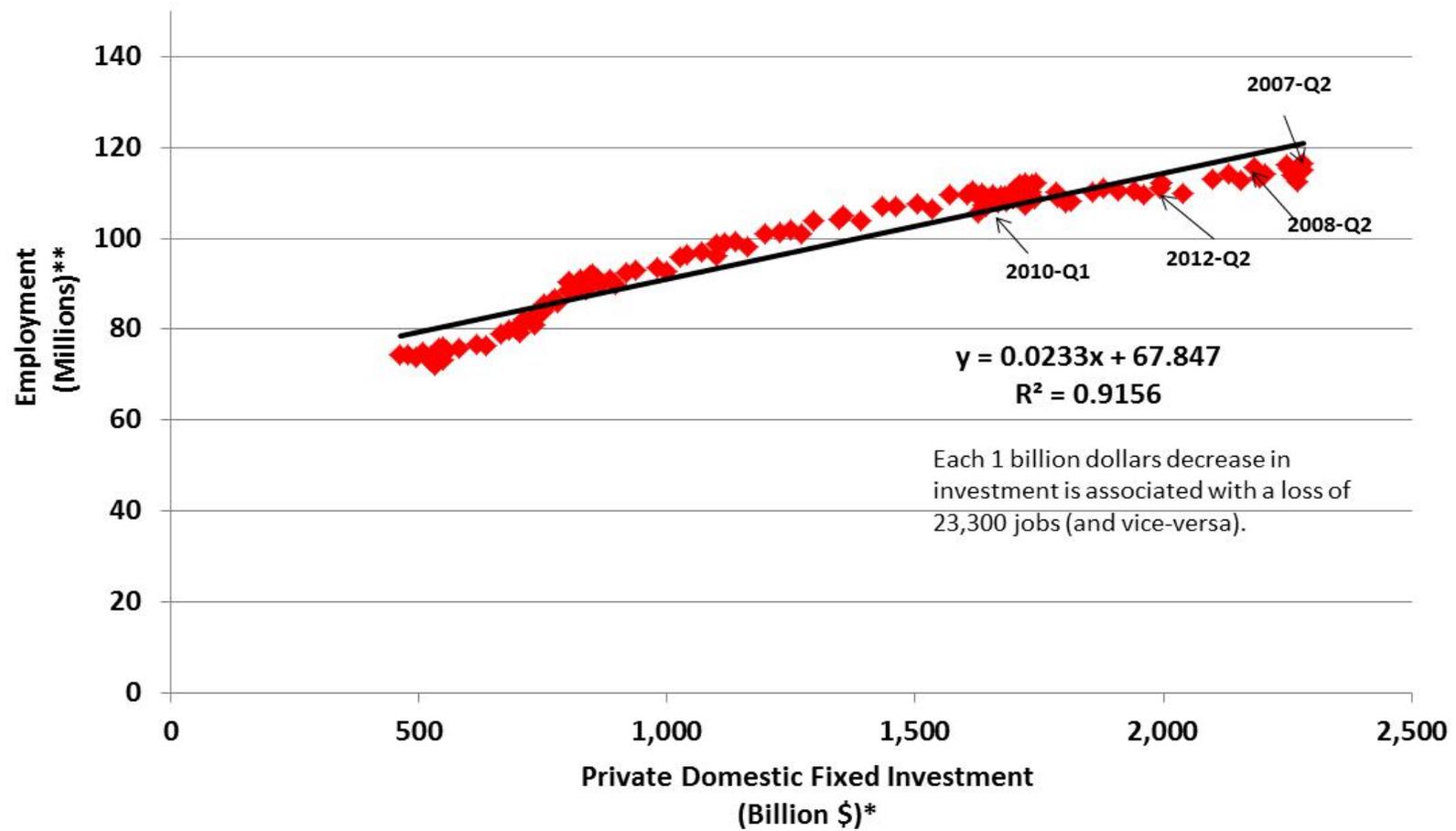
Source: Uncertainties in Projections of Climate Change, Jouni Raisanen, 14 October 2010, http://www.baltex-research.eu/ecosupport/events/uncertainty_workshop_2010/Jouni_Raisanen.pdf

Figure 2. Absolute Differences between Climate Models' Estimates of Temperature and Precipitation Increase with Time



Source: Uncertainties in Projections of Climate Change, Jouni Raisanen, 14 October 2010, http://www.baltex-research.eu/ecosupport/events/uncertainty_workshop_2010/Jouni_Raisanen.pdf

**Figure 3. Total Private Employment and Private Domestic Fixed Investment
1980-Q1 to 2012-Q2**



* Seasonally adjusted at annual rates, data source Bureau of Economic Analysis.

** End of quarters, data source Bureau of Labor Statistics

Prepared by American Council for Capital Formation, July 27, 2012.

Table 1 Economic Impact on the United States of Switching to a Consumption Tax in 1991

Expensing business investment, removal of the business and personal interest deduction, and tax exemption of savings

	Average 1991–1995	Average 1996–2000	Average 2001–2004
Real GDP—level (billions of 96\$)			
Base	7,085.8	8,499.6	10,113.1
Simulation of consumption tax	7,203.2	8,890.0	10,637.7
(Difference in level)	117.5	390.5	524.6
(Percent change in level)	1.7%	4.6%	5.2%
Business capital spending, total (billions of 96\$)			
Base	684.2	1,092.0	1,599.6
Simulation of consumption tax	824.9	1,495.6	2,168.8
(Difference in level)	140.7	403.5	569.2
(Percent change in level)	20.6%	37.0%	35.6%
Consumption (billions of 96\$)			
Base	4,761.7	5,717.2	6,746.3
Simulation of consumption tax	4,773.3	5,843.4	7,021.5
(Difference in level)	11.6	126.1	275.3
(Percent change in level)	0.2	2.2	4.1
S&P 500 Price Index			
Base	449.1	1081.9	1803.2
Simulation of consumption tax	557.4	1370.5	2123.4
Difference	108.4	288.6	320.2
(Percent difference in level)	24.1%	26.7%	17.8%
Employment (millions of persons)			
Total payrolls, base	111.8	125.8	138.5
Total payrolls, simulation of consumption tax	111.8	129.3	140.9
(Difference in level)	0.0	3.6	2.4
Productivity (annual percent change)			
Nonfarm business, base	1.5	2.7	2.3
Nonfarm business, simulation of consumption tax	2.6	2.8	2.8
Difference	1.1	0.1	0.5
Total federal tax receipts			
Base	6,210.5	8,853.2	9,179.3
Simulation of consumption tax	5,745.5	8,821.0	9,607.7
(Difference in level)	-465.0	-32.2	428.5

Source: See Margo Thorning, “U.S. Capital Formation: How the U.S. Tax Code Discourages Investment”, http://www.ipi.org/ipi_issues/detail/us-capital-formation-how-the-us-tax-code-discourages-investment using data from Allen Sinai, “Macroeconometric Model Simulation With the Sinai-Boston Model of the U.S. Economy,” unpublished study, 2001.