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A LETTER FROM THE EDITOR

For the second edition of *The Georgetown Public Policy Review*'s 20th year of publication, we decided to focus on an important and often overlooked area of policy – regulation. While we often hear from politicians that we have either too many or too few regulations, we rarely go beyond the arguments for small or large government to investigate the actual implications of rulemaking on policy outcomes.

Laura Wilson, the Executive Print Editor for this edition, and her team have worked with authors whose work shines a spotlight on the process and outcomes of rulemaking. Josh Bivens uses cost benefit analysis to evaluate the Environmental Protection Agency's proposed Clean Power rule and highlights how using regulation can offer a way around legislative impasse and prove an effective mechanism for achieving political goals. Next, Gary Bass, Daniel Gotoff, Celinda Lake, Katherine McFate, and Robert Weissman make the case that support for strong enforcement of regulation cuts across party lines. Reba Carruth discusses international regulatory policy cooperation in the context of the Food and Drug Administration, and Akshay Sinha explores what is needed to create effective regulatory structures for the electric power industry, using examples from Europe and Asia. Uuriintuya Batsaikhan looks at the performance of Switzerland's economy during the financial crisis, and asks whether policy or unique circumstance led to its exceptional performance relative to its European peers. Finally, we end this edition with an interview with the McCourt School's first postdoctoral fellow, Gaurav Sood, whose work involving the use of massive data is at the heart of what may be the next arena for state regulatory intervention.

Collectively, these authors identify enforcement, agency independence, employment impacts, national and state capacity, and timeliness of interventions as ways to evaluate the role, efficacy, and "right-size" of regulatory bodies. Not all readers will agree with their conclusions, but we hope that the evidence and arguments they lay out will offer something for all readers to reflect upon.

Robin Duddy-Tenbrunsel
Editor in Chief

A Comprehensive Analysis of the Employment Impacts of the EPA's Clean Power Plan

Josh Bivens

Estimates made by the Environmental Protection Agency (EPA) of the likely employment effects of a proposed rule (the Clean Power Plan) mandating reductions in greenhouse gas emissions from existing power plants are incomplete. These estimates undercount both positive and negative influences on employment. This paper provides a comprehensive overview of the channels through which the mandated emissions reductions may lead to employment changes, both positive and negative. It finds that the Clean Power Plan is likely to lead to a net increase in employment of roughly 360,000 jobs by 2020, but that the net job creation falls relatively rapidly thereafter, with net employment gains of roughly 15,000 by 2030. Comparisons of the composition of employment in job-gaining versus job-losing industries are also made. The characteristics of employment in job-losing industries, as well as the likely geographic concentration of gross job losses in poorer states, are likely to lead to transition challenges for workers and communities in responding to the Clean Power Plan. This suggests the potential for a key role for federal assistance and complementary policies to aid these groups.

I. INTRODUCTION

In June of 2014, the Environmental Protection Agency (EPA) issued a proposed regulation to set emission limits that states must follow by developing plans to address greenhouse gas emissions from existing fossil fuel-fired electric generating units (EGUs).[1] The requirements within the Clean Power Plan (CPP) must be adopted by all EGUs by 2020.

This rule is the most substantive US regulatory undertaking aimed at mitigating global climate change. In 2007, the Supreme Court ruled that greenhouse gas emissions are covered by the 1970 Clean Air Act's definition of an air pollutant, and that the EPA must determine whether or not these emissions cause or contribute to air pollution that may be reasonably anticipated to endanger public health or welfare. Legislative efforts to mitigate greenhouse gas emissions passed the US House of Representatives in 2009, but failed to gain a vote in the Senate. Passage of such legislation to mitigate greenhouse gas emissions would

1 An electrical generating unit is a power plant. In the case of EGUs targeted by the Clean Power Plan, it is those power plants that use energy from burning coal to generate electricity.

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almost certainly have kept the EPA proposed rule from moving forward.

Although the economic, health, and environmental effects of the proposed rule are significant, this paper will focus on just one impact: potential effects on employment. Despite the fact that jobs and employment-growth are one of the smallest outcomes of the rule, its significant influence on this garners attention – as does the jobs-impact of most environmental legislation and rulemaking. In the regulatory impact analysis (RIA) that accompanied the release of the proposed rule, the EPA provided preliminary estimates of the direct impact of the rule on employment. This paper aims to build and to improve upon the EPA estimates and provide a comprehensive account of how the rule may affect US employment. The key findings of this paper are:

- In the near-term (through 2020), the number of jobs supported by increased investments in renewables and efficiency investments is about 96,000 more than the number displaced by power plant retirements and reduced mining employment. By 2030, the gap between jobs supported and displaced is much smaller, but still positive (roughly 15,000).

- The net number of jobs supported in the near-term is larger (roughly 360,000) when taking indirect effects (supplier jobs, induced (re-spending or "Keynesian" effects), and public sector jobs supported through tax revenues) into account. But in the longer-term, the indirect effects actually reduce the net number of jobs supported to roughly 9,000.

- Higher electricity prices on a scale similar to those resulting from the CPP have the potential to reduce employment by between 25,000 and 150,000 if they are not anticipated. The assumption of price changes being unanticipated is only possible for the near-term (through 2020); in the medium and long-run any employment changes resulting from electricity price changes are unlikely.

- The labor force characteristics of jobs displaced and jobs supported following the CPP are quite different. Jobs displaced are more likely to be unionized, skew more towards male workers, and provide fewer low-wage and more middle-wage jobs than jobs supported, even though jobs supported are more likely to be filled by workers without a four-year college degree.

- Gross job losses are likely to be geographically concentrated, raising the challenge of ensuring a fair transition for workers in sectors likely to contract due to the CPP.

The first section of the paper describes the possible theoretical channels through which the proposed rule (referred to here as the CPP) may affect employment. Subsequent sections provide an empirical assessment of each channel, followed by a sum of the effects to provide an overall estimate of the employment changes spurred by the CPP. This estimate includes gross job gains, gross job losses, and net changes (the sum of gross positive and negative changes). Finally, the paper examines job quality differences between gross job gains and gross job losses.

II. CHANNELS THROUGH WHICH THE CPP MAY IMPACT EMPLOYMENT

The CPP mandates emissions reductions on a state-by-state basis. By setting an overall state target, however, it leaves states many margins of adjustment along which to realize these emissions reductions. For example, states could mandate a share of overall electricity generation to come from non-emitting sources. Or they could provide incentives for business, utilities, and households to make investments in energy efficiency. There is even the possibility of states joining together to form a regional cap-and-trade system that only allows utilities to emit greenhouse gases after purchasing a marketable permit to do so. Given this flexibility in state response, there is great uncertainty in the precise economic outcomes that will be driven by the rule's implementation. For the purposes of this paper, I follow the economic modeling undertaken by the EPA in their regulatory impact analysis and translate their economic projections (include preliminary employment projections) into comprehensive measures of employment changes.

ECONOMIC MARGINS OF ADJUSTMENT

The EPA's regulatory impact analysis identifies a number of margins of economic adjustment as likely to be most important to states to meet the emissions reduction guidelines. In the near term, electricity production from coal-fired electrical generating utilities will fall, and output by natural gas-fired power plants will increase. Construction of new electricity generation from renewables (mostly wind and solar) will be front-loaded during the first ten years of the rule, accelerating additions of renewable generating capacity. Solar and wind power will then replace some of the declines in coal-fired generation, particularly in the medium-term (more than five years out). Energy efficiency investments will also be accelerated by the rule. These efficiency investments in homes, businesses, and industry will allow electrical generation to fall significantly relative to baseline by 2030. Examples of such energy efficiency investments include the purchase of more efficient home appliances and the upgrade of insulation in residential homes; the optimization of heating, ventilation, air-conditioning systems, and electrical lighting in commercial buildings; and process optimization through modern instrumentation and control systems in the industrial sector.

Further, the sum of these effects is expected to raise electricity prices, particularly in the near-term. The efficiency investments will, however, sufficiently dampen the demand for electricity quantities to lower overall household electricity spending by the end of the period described in the EPA regulatory impact analysis on the rule.

EMPLOYMENT MARGINS OF ADJUSTMENT

Employment changes will follow directly from these economic margins of adjustment. A number of channels will lead to employment reductions. For example, retirement of coal-generated electrical generating capacity will lead to losses in operations and maintenance employment at existing coal-fired power plants. These effects show up in both short- and longer-run horizons examined by the regulatory impact analysis. The switch from coal-fired generation will lead to a reduction in demand for coal, and subsequent significant declines in both the short and long-term for coal mining jobs. Increases in energy prices will spur employment responses, including demand-side

reductions in spending, as households facing higher electricity bills (at least in the short-run) curtail spending on non-energy goods. There will also be supply-side reductions as the (slight) decline in real wages spurred by rising energy prices affects labor supply decisions. Finally, there may be responses related to international competitiveness, as higher domestic energy prices affect the cost of producing in the United States.

Conversely, a number of changes spurred by the CPP will lead to employment gains (or at least no losses) in both the near- and longer-term. For example, investments in energy efficiency lead to employment increases in all time horizons. Short-term investments in heat rate improvement of existing fossil-fuel power plants will spur employment in the near-term without reducing employment in the longer-term. Operations and maintenance jobs at natural gas power plants will rise slightly in all periods.

Some of these margins of economic adjustment to the CPP have different employment impacts depending on the time-horizon. For example, construction of new natural gas generation boosts employment in the short-run, but reduces employment in the longer-run, as jobs associated with planned natural gas EGU expansions are pulled forward in time by the rule. In the near-term, this implies increases in construction jobs for building this new capacity, but some of this comes at the expense of construction in the medium and longer-term. Similarly, construction of new renewable generation creates employment growth in the short-term, but reductions in medium and longer-term as these jobs are pulled forward relative to the non-CPP baseline.

Finally, each of these channels will in turn spur indirect effects. The indirect effects tracked in this paper will include: supplier jobs, induced (Keynesian) re-spending jobs, and public sector jobs supported through tax revenue. The sections that follow will provide an empirical estimate of the effect of each of these channels, including indirect channels.

III. DIRECT EMPLOYMENT EFFECTS: TRANSLATING CHANGES BY ECONOMIC ACTIVITY INTO INDUSTRY CHANGES

This section will first report the estimates on direct employment effects contained in the EPA regulatory impact assessment, and will then assign these employment effects into specific industry codes that can be used as inputs into employment requirements matrices in order to undertake the analysis of indirect effects included in later sections of the report.

The regulatory impact assessment essentially provides four different estimates (or scenarios) for each of these flows in every year. The regulatory impact assessment estimates effects stemming from a "state-only" approach and a "regional" approach to meeting emissions targets. The Clean Power rule provides the option for states to collectively meet combined ("regional") emissions targets. This may alter the margins of adjustment for meeting emissions guidelines as compared to a single state-only approach. The regulatory impact analysis also provides two different options for the level and pace of emissions reductions that states must meet. One of the options is recommended by the EPA, the second is offered and public comment is invited. In what follows, I average the outcomes estimat-

ed by the regulatory impact analysis in the four different scenarios (two emissions guidelines that can be met by either single-state or regional action). Because the differences in outcomes stemming from the four different scenarios are quite small, this averaging approach does not compromise the overall findings.

The main driver of these direct effects on employment is simply the change in electricity generation: both overall and by type (summarized below in Table 1). Throughout this paper economic impacts (whether electrical generation, prices, or job-flows) of the CPP will be expressed relative to a baseline estimated by the EPA regarding the likely path of these variables if the CPP were not implemented. Relative to this non-CPP baseline projection for future electricity generation, the CPP leads to an 18.6 percent decline in coal-fired electricity generation by 2020, and a 26.1 percent decline by 2030. Renewables, conversely, rise by 6.4 percent by 2020 relative to the non-CPP baseline. By 2030, however, renewable generation is just 1.7 percent above the projected baseline. Natural gas generation rises by 14.6 percent relative to the non-CPP baseline by 2020, but by 2030 actually falls 5.7 percent. Besides the decline in coal-fired generation, the most striking finding in Table 1 is the decline in total generation, which is es-

Table 1: Electricity Generation by Source, Baseline and Under CPP

	Total (MW)				Share		
	Baseline	Post-CPP	Change	% Change	Baseline	Post-CPP	P.p. change
2020							
Coal	1,665	1,355	310	-18.6%	39.5%	33.0%	-6.4%
Natural Gas	1,159	1,328	-169	14.6%	27.5%	32.4%	4.9%
Nuclear	817	817	0	0.0%	19.4%	19.9%	0.6%
Hydro	280	282	-2	0.5%	6.6%	6.9%	0.2%
Non-hydro renewables	299	318	-19	6.4%	7.1%	7.8%	0.7%
Total	4,220	4,100	120	-2.8%	100.0%	100.0%	0.0%
2025							
Coal	1,702	1,315	387	-22.7%	38.7%	32.1%	-6.6%
Natural Gas	1,263	1,340	-77	6.1%	28.7%	32.7%	4.0%
Nuclear	817	817	0	0.0%	18.6%	19.9%	1.4%
Hydro	280	282	-2	0.6%	6.4%	6.9%	0.5%
Non-hydro renewables	335	344	-9	2.7%	7.6%	8.4%	0.8%
Total	4,397	4,098	299	-6.8%	100.0%	100.0%	0.0%
2030							
Coal	1,668	1,233	436	-26.1%	36.7%	30.5%	-6.1%
Natural Gas	1,455	1,372	83	-5.7%	32.0%	34.0%	2.0%
Nuclear	797	797	1	-0.1%	17.5%	19.7%	2.2%
Hydro	280	281	-1	0.2%	6.2%	6.9%	0.8%
Non-hydro renewables	350	356	-6	1.7%	7.7%	8.8%	1.1%
Total	4,550	4,038	513	-11.3%	100.0%	100.0%	0.0%

Source: EPA Regulatory Impact Analysis of Clean Power rule (2014). Table 1's estimates average two options as well as state and regional compliance scenarios.

sentially a reflection of energy efficiency investments. Relative to the baseline, total generation falls 2.8 percent by 2020 and 11.3 percent by 2030.

The projected change in total electrical generation leads to corresponding changes in employment flows that are directly estimated by the EPA regulatory impact assessment. The directly estimated employment changes by category are summarized in an appendix in Table A1. Before presenting these findings on the direct employment flows, however, it is important to be specific about how these are expressed.

Again, each employment impact is relative to what would have occurred in the EPA's non-CPP baseline. Relative to this baseline, the EPA estimates a change in coal extraction in 2020, 2025, and 2030. In 2020, coal extraction employment is down 12,600 jobs relative to the no-CPP. This means that employment in coal mining is 12,600 lower than would otherwise be expected in that year because of the CPP. In 2025, coal extraction employment is down 15,300 relative to baseline. This does not mean that coal mining employment is 15,300 lower in 2025 than it was in 2020, but that the estimate is relative to that in a non-CPP world. Further, one cannot add the 2020 and 2025 estimates together and say that coal mining employment is reduced by 27,900 in 2025 due to the CPP. One can infer that the effect of the CPP on coal mining employment between 2020 and 2025 is a reduction of 2,700 (the difference between 15,300 and 12,600). Qualitatively, this means that the bulk of the effect of the CPP on coal mining extraction occurs before 2020, and that the rule's drag on coal extraction employment thereafter is less intense (though it does still grow).

INDENTIFYING THE SPECIFIC INDUSTRIES AFFECTED BY THE EPA EMPLOYMENT ESTIMATES

Indirect employment effects associated with the direct employment consequences identified in the regulatory impact analysis will lean heavily on being able to use input-output (or employment requirements) matrices to identify supplier jobs associated with direct employment changes. This involves categorizing the direct employment losses identified in the CPP regulatory impact assessment into the 195 industrial sectors covered by the employment requirements matrices (ERM) that are available from the Bureau of Labor Statistics (BLS). The EPA analysis of employment changes by economic activity detailed in Table A1 can be translated into employment changes occurring in the industrial sectors in the ERM. The exact mapping of economic activity identified by the EPA employment estimates to an industrial classification is provided in Appendix C. The outcome of this mapping is summarized in Table 2, which presents employment changes by gaining and losing industries separately for each year as well as the net industry employment effects. I discuss the BLS ERM in greater detail in the next section.

IV. INDIRECT EMPLOYMENT IMPACTS

By taking the EPA's direct estimates of first-round employment changes spurred by the CPP and calculating their indirect job impacts, this paper adds to the impact assessment of the CPP. In particular, because jobs in different industries can have very different levels of indirect employment associated with them, the EPA estimates on net job creation and displacement could be different or even change in sign from positive to negative when these indirect

Table 2: Direct Employment Changes Estimated by the EPA, Mapped to Industrial Sectors

	Gains			Losses			Net		
	2020	2025	2030	2020	2025	2030	2020	2025	2030
Oil and gas extraction	5,050	2,700	0	0	0	2,000	5,050	2,700	-2,000
Coal mining	0	0	0	12,600	15,300	17,300	-12,600	-15,300	-17,300
Electric power generation, transmission, and distribution	0	0	0	11,663	20,425	24,300	-11,663	-20,425	-24,300
Construction	16,160	3,203	1,313	0	0	0	16,160	3,203	1,313
Plastics product manufacturing	953	0	0	0	345	129	953	-345	-129
Machine shops: hardware	1,389	0	0	0	503	188	1,389	-503	-188
Fabricated metal	2,104	0	0	0	4,633	5,977	2,104	-4,633	-5,977
HVAC equipment manufacturing	20,573	17,269	17,440	0	0	0	20,573	17,269	17,440
Engine, turbine, and power transmission equipment manufacturing	12,970	0	0	0	5,107	8,048	12,970	-5,107	-8,048
Machinery manufacturing	2,937	0	0	0	1,064	398	2,937	-1,064	-398
Communications equipment	551	763	771	0	0	0	551	763	771
Electric lighting manufacturing	30,388	42,114	42,530	0	0	0	30,388	42,114	42,530
Household appliance manufacturing	2,624	3,637	3,673	0	0	0	2,624	3,637	3,673
Electrical equipment manufacturing	4,164	3,342	3,695	0	0	0	4,164	3,342	3,695
Other electrical equipment and component manufacturing	1,627	0	0	0	589	220	1,627	-589	-220
Design services	1,152	0	0	0	4,288	5,848	1,152	-4,288	-5,848
Management, scientific, and technical consulting services	8,113	0	0	0	0	0	8,113	0	0
Scientific research and development services	1,945	0	0	0	704	263	1,945	-704	-263
Services to buildings and dwellings	7,238	10,031	10,130	0	0	0	7,238	10,031	10,130
Total	119,938	83,059	79,552	24,263	52,959	64,672	95,675	30,100	14,880

Note: Following the mapping identified in Table A4 and based on the estimates of employment change by activity estimated in the EPA regulatory impact analysis.

effects are taken into account. In this section, I estimate three separate categories of indirect job impacts that are spurred by the first-round employment changes documented in the regulatory impact assessment: supplier jobs, induced (or re-spending) jobs, and public sector jobs. I label the total of these influences as the "employment multiplier." [2]

SUPPLIER JOBS, MATERIALS

Supplier jobs are generally the most intuitive category of indirect employment changes. Put simply, when jobs are lost in one industry sector, the sectors that provide inputs and materials also suffer losses. Take a concrete example: when coal mining activity shrinks, it leads to a reduction in demand for industries that provide inputs to coal mining, such as those that provide safety equipment, industrial equipment, and/or transportation equipment.

2 The employment multipliers for all 195 industries are available upon request.

Supplier job estimates can be calculated directly from the BLS ERM. The ERM shows how many jobs are supported by $1 million in final demand in a given sector; jobs both in the sector directly satisfying the final demand as well as ones supplying inputs. For example, each $1 million in final demand for construction services supports jobs in the construction sector, but also supports jobs in concrete production, bulldozer manufacturing, and accounting services. The ERM tracks how many jobs in these supplier industries are supported by each $1 million in construction services purchased.

Because the ERM is set up in terms of dollar flows rather than job flows, translating the direct employment impacts identified by the CPP regulatory impact assessment into supplier jobs requires a small manipulation. Specifically, I take the ratio of jobs supported by a given amount of spending in a sector that are supplier jobs to direct jobs, and then multiply this by the number of direct jobs identified in the CPP regulatory impact assessment. The estimate for supplier jobs supported by each 100 direct jobs in a given sector is calculated using:

$$((ER_{total} - ER_{direct}) / ER_{direct}) * 100$$

SUPPLIER JOBS, CAPITAL SERVICES

One weakness of the BLS ERM is that it does not account for the depreciation of capital goods (plant and equipment and structures) that is caused by production. For very capital-intensive industries – and utilities and extraction are both notably capital-intensive – this could have non-trivial impacts on jobs supported.

To correct this, I estimate the number of jobs associated with producing the capital goods that would be needed to replace the amount of depreciation associated with 100 direct jobs in an industry. First, I estimate the value of capital services used in each industry's production. To do this, I use data from the BLS data series on multi-factor productivity (MFP), which provides data on the capital share of output (that is, the share of income generated by each industry that goes to pay owners of capital goods rather than workers). Combining industry output with the capital share provides an estimate of the amount of new capital goods that must be produced each period to replace this capital service flow. Essentially, capital-intensive industries will have to spend more money to replace capital services that are used up during production. Because I begin with a given number (100) of jobs (rather than output) in each industry, calculating industry output again requires a small manipulation of the data. The first expression in parentheses below shows how output (measured in dollars) per each 100 workers in a given industry can be calculated. This output measure is then multiplied by the capital share to give the expression for depreciation (or capital service inputs) associated with each industry.

$$(\$1{,}000{,}000/ER_{direct}) * 100 * \text{Capital share of output} = \text{Depreciation}$$

This measure of depreciation is then used to estimate industry capital demand. Based on ratios that approximately reflect the economy-wide division of aggregate capital investment to structures versus equipment, I assume that 40 percent of this total spending flows into construction to replace new structures and 60 percent flows into equipment manufacturing to replace machinery. From here, the formula for supplier jobs to replace the depre-

ciation involved with every 100 direct jobs in a given industry is:

$$ER_{total\_equipment} * (Depreciation / \$1{,}000{,}000) * 0.6 + ER_{total\_structures} * (Depreciation / \$1{,}000{,}000) * 0.4$$

INDUCED (OR RE-SPENDING) JOBS

Another category of indirect jobs concerns those that are supported by the demand that relies on the wage and salary income of direct jobs. For example, each 100 jobs in construction also supports jobs in restaurants and diners where construction workers eat, grocery stores where they shop for food, and doctors' offices where they pay for medical services.

The scale of induced jobs supported by each 100 direct jobs depends on the overall "re-spending multiplier." Bivens (2006) reviewed evidence on this multiplier and takes 0.5 as a conservative estimate of this effect. Induced jobs also depend on the relative wages of both direct and supplier industries. As an example, if automobile assembly jobs have wages that are 50 percent higher than the economy-wide average wage, this would lead to spending induced by each 100 jobs in that sector being 50 percent higher than the economy-wide average, making the induced spending multiplier this much higher. Further, if the supplier jobs supported by automobile assembly (steel, iron, glass, etc.) pay higher-than-average wages, then this will also increase the induced spending multiplier for the automobile assembly sector.

I index hourly wages by industry to establish an economy-wide average of one. From here, we can express the induced jobs supported by each 100 direct jobs in an industry as simply 100 times the index of average hourly wages in the industry times 0.5 (our re-spending multiplier). For supplier jobs, I multiply the (195 sector) vector of supplier jobs associated with a given 100 jobs in the direct industry by each industry's average hourly wage index, multiply by 0.5 (the re-spending multiplier) and then sum to estimate the induced spending from supplier jobs associated with direct employment in a given sector.

PUBLIC SECTOR JOBS

Finally, we can estimate the number of public sector jobs (federal, state, and local) associated with each 100 direct jobs in an industry. This measure differs across industries based on the relative wage of the industry. To generate the inputs for this calculation, I multiply each industry's hourly wage by 2,000 to express it as a full-time, full-year salary. For federal taxes, I multiply this by 0.2, and for state and local taxes, by 0.1. This provides a rough measure of the tax revenue supported by each job in an industry.

I then use Census data to obtain estimates of overall tax revenue and employment in federal, state, and local governments. Dividing total tax revenue by employment, I get a measure of how much tax revenue is required to support a public sector employee in federal versus state and local government employment. I then divide the tax revenue generated by each 100 jobs in a given industry by this per employee wage bill to get a measure of public sector employment generated.

SUMMING UP THE INDIRECT EFFECTS OF CHANGING INDUSTRY EMPLOYMENT

Table 3 below provides a summary of the indirect effects for each of the direct industry job

flows estimated by the EPA. The largest multipliers, by a considerable margin, are in the oil and gas mining sector and the utilities sector. Large multipliers also are found in most of the manufacturing industries that receive considerable direct job flows, particularly the household appliance manufacturing sector. The net effect of the job multipliers is to increase the total net employment impact spurred by the direct spending flows that occur due to the CPP in the near-term. That is, in 2020, approximately 95,000 more jobs are generated directly through energy efficiency investments, heat rate investments, and the construction of new capacity than are displaced directly from coal plants retiring early and mining jobs being displaced. Further, 264,000 more jobs are generated when indirect effects are considered. However, by 2030 the estimated job gains are smaller than the direct employment flows would indicate. This is due largely to two influences: first, direct job creation in later years is expected to ebb because renewable and natural gas generation investments triggered by the CPP largely represent an acceleration of investments that would have occurred eventually even in the absence of the CPP; second, the employment multipliers of jobs in EGUs and coal mining are large, and these sectors are projected to shed jobs even in the medium- and longer-term horizons.

V. PRICE EFFECTS ON EMPLOYMENT

There will also be job effects stemming from the rise in electricity prices projected to result from the new rule. On average across the four scenarios ("Option 1 and 2" and "State and Regional" approaches), the electricity price increase by 2020 will be 5 percent, and will decline to 2.7 and 2.9 percent in 2025 and 2030 respectively. Economic theory is far from settled on how the rise in a single price in the economy will affect economy-wide employment. In this section, I provide some broad parameters about the possible impacts, and then offer some evidence from simple regressions to assess the impact of electricity price changes on employment.

In order to establish some parameters to check the plausibility of regression results, assume first that the entire 5 percent increase in electricity prices leads to no reduction in demand from consumers. Multiply this 5 percent by electricity's share in the total economy (2.4 percent)[3] and this translates to a 0.12 percent decline in economy-wide demand for goods and services besides electricity. That is, by having to pay 5 percent more for electricity and not adjusting their demand at all, American households now have 0.12 percent less to spend on non-electricity goods and services. Given that economy-wide consumption spending in 2013 was roughly $11.5 trillion, this implies roughly a $14 billion decline in purchasing power. Given that each job in the US economy is associated with roughly $140,000 in gross domestic product, this $14 billion decline in purchasing power in turn translates into roughly 100,000 jobs that would be displaced by a demand reduction of this magnitude.[4]

3 Electricity's share in the total economy is based on data from 2013 using data collected by the Bureau of Economic Analysis (BEA).

4 For translating changes in spending flows and gross domestic product (GDP) into jobs, see Bivens (2011).

Table 3: Estimating Indirect Employment Effects from Changes in Industry Demand

	Direct Jobs			Indirect Effects per 100 Direct Jobs							Total Indirect Jobs		
				Supplier Jobs		Responding Jobs		Public Jobs					
	2020	2025	2030	Materials	Capital Services	Direct	Indirect	Federal	State + Local	Total	2020	2025	2030
Oil and gas extraction	5,050	2,700	-2,000	271.9	200.0	29.0	158.6	4.2	9.9	673.5	34,013	18,185	-13,470
Coal mining	-12,600	-15,300	-17,300	89.7	61.9	60.7	48.6	2.4	5.8	269.0	-33,895	-41,158	-46,538
Electric power generation, transmission and distribution	-11,663	-20,425	-24,300	152.7	187.9	47.9	72.0	2.7	6.3	469.5	-54,761	-95,905	-114,100
Construction	16,160	3,203	1,313	40.8	32.7	72.0	21.5	2.1	4.9	173.9	28,104	5,571	2,284
Plastics product manufacturing	953	-345	-129	99.6	24.6	55.9	50.7	2.4	5.6	238.8	2,275	-824	-308
Machine shops: hardware	1,389	-503	-188	54.7	19.8	43.0	28.5	1.6	3.8	151.4	2,103	-762	-285
Fabricated metal	2,104	-4,633	-5,977	101.7	18.8	47.1	52.4	2.2	5.2	227.5	4,787	-10,541	-13,598
HVAC equipment manufacturing	20,573	17,269	17,440	144.8	54.8	41.4	75.0	2.6	6.1	324.7	66,797	56,069	56,623
Engine, turbine and power transmission equipment manufacturing	12,970	-5,107	-8,048	166.2	64.5	53.3	85.9	3.1	7.3	380.4	49,333	-19,426	-30,613
Machinery manufacturing	2,937	-1,064	-398	148.7	29.7	63.6	76.0	3.1	7.3	328.4	9,645	-3,494	-1,306
Communications equipment	551	763	771	137.7	72.1	46.8	76.0	2.7	6.5	341.8	1,882	2,608	2,634
Electric lighting manufacturing	30,388	42,114	42,530	126.5	48.7	75.5	66.8	3.2	7.5	328.2	99,720	138,199	139,564
Household appliance manufacturing	2,624	3,637	3,673	198.1	75.3	65.5	102.0	3.7	8.8	453.5	11,903	16,495	16,658
Electrical equipment manufacturing	4,164	3,342	3,695	82.7	27.3	64.5	43.2	2.4	5.7	225.8	9,402	7,547	8,344
Other electrical equipment and component manufacturing	1,627	-589	-220	108.9	35.3	59.2	56.8	2.6	6.1	268.8	4,374	-1,584	-592
Design services	1,152	-4,288	-5,848	31.4	28.1	61.0	18.2	1.8	4.2	144.7	1,666	-6,203	-8,460
Management, scientific and technical consulting services	8,113	0	0	47.5	32.1	47.7	30.2	1.7	4.1	163.3	13,251	0	0
Scientific research and development services	1,945	-704	-263	80.7	48.7	46.6	48.3	2.1	5.0	231.4	4,499	-1,630	-609
Services to buildings and dwellings	7,238	10,031	10,130	16.7	12.3	85.2	9.3	2.1	5.0	130.6	9,455	13,104	13,233
Total	95,675	30,100	14,880								264,554	76,252	9,462

Note: Direct jobs by industry from Table 2 and Table A4. Indirect effects estimated using method described in text.

But, of course, this assumption of no demand response is extremely strong, responsiveness of consumers to energy price increases (or the elasticity of demand for electricity) may be relatively low in the short-run, but is expected to be greater than zero and there is strong evidence that it rises sharply over time [see Maddala et al. (1997)].

If one made a strong assumption in the opposite direction, that a 5 percent increase in the price of electricity was met immediately by a 5 percent reduction in demand for electricity (implying an elasticity of demand of one), then there would be no overall demand effect stemming from reduced consumer spending; consumers would simply shift their spending away from electricity and towards other goods and services.

This thought experiment helps to establish some parameters for what a reasonable estimate of the employment response to an electricity price increase should be based simply on consumers' responses. Given that consumer spending is two-thirds of the US economy, the employment response due to changes in consumer spending is expected to be a large part of the total employment effects.[5] Any estimates of job declines that are much larger than the hig end of these rough benchmarks essentially need to be accompanied by a compelling theoretical reason for why they are so large, since the high end of mechanical effects of higher electricity prices "crowding-out" spending on other goods seems well-defined for price increases of 5 percent or less.

VI. REGRESSION ANALYSIS

I undertake two methods of regression analysis to assess the impact of higher electricity prices on overall employment. First, I use a vector autoregression of total non-farm payroll employment on changes in electricity prices (following Killian, 2013). By ordering electricity prices first, and making the assumption that employment changes in a given month do not affect electricity price changes in that same month, the results can be interpreted as the causal effect of electricity price changes on employment. Second, I assemble a panel dataset of states from 1976 to 2013 to test how changes in electricity prices correlate with employment changes. For this set of regressions I follow Deschenes (2009).

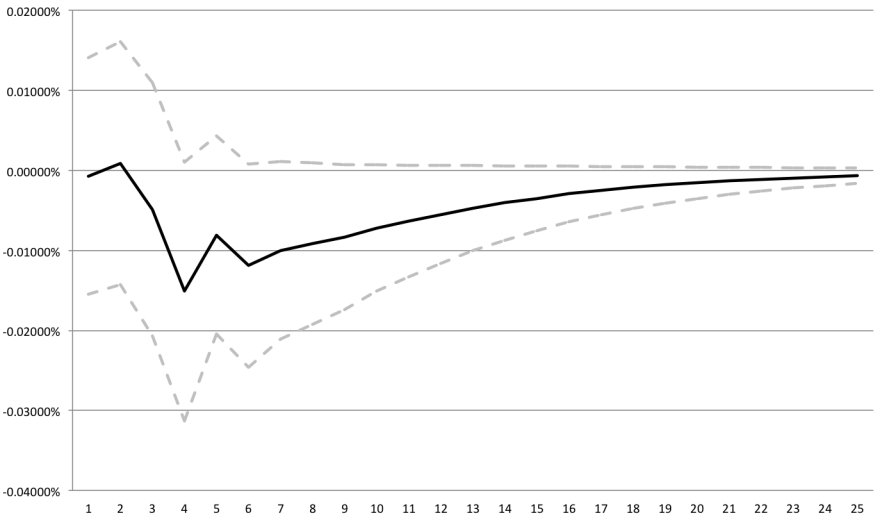
VECTOR AUTOREGRESSION ESTIMATES

For the vector autoregression test, I use data on non-farm payroll employment and electricity price data from the consumer price index (CPI), both from the BLS. I run a vector autoregression with electricity prices ordered first. To assess the effect of higher electricity prices on employment, I simulate the effect of an electricity price shock. Figure 1 shows the results of this "impulse response function," showing how employment responds to a one standard deviation shock to electricity prices.

The data shows a clear pattern of a quick decline in employment that converges back towards zero effect. The magnitudes (0.015 percent) multiplied by the 2014 workforce of roughly

5 The labor supply effects of such an electricity price increase are likely to be considerably smaller. The 5 percent increase in electricity prices represents roughly a 0.12 percent reduction in real wages. Typical labor supply elasticities range from 0.1 to 0.3, so this implies a 0.0036 percent reduction in labor supply at most, or roughly 5,400 fewer jobs stemming from workers' voluntary labor supply decisions.

Figure 1: VAR Impluse Response of Employment to 1 SD Shock to Electricity Prices



Note: Impulse response estimated from VAR regression of monthly payroll employment and monthly electricity prices and their own-lags, with payroll employment ordered first. Ninety-five percent confidence interval shown in shaded lines. Data on monthly employment from the BLS Current Employment Statistics, and data on electricity prices from the Consumer Price Index from BLS.

140 million) suggest an employment decline of nearly 20,000 (0.015 percent, as indicated on the figure) after four months, and then a fade-out of more than 90 percent of the effect within a year (with the remaining negative effect no longer statistically significant). A one standard deviation shock to electricity prices in this data is 4 percent, so I multiply the employment decline from the impulse response function by 5/4 to estimate the employment impact of a 5 percent increase in electricity prices generated by the CPP, giving a final point estimate of 25,000 jobs displaced by higher electricity prices.

STATE PANEL REGRESSIONS

The state/year panel results are summarized in Appendix Table A4. This table shows the results of a regression that uses the log of the level of state employment on the log of electricity prices across states. The employment data comes from the BLS, while state-level electricity price data comes from the State Energy Data Service (SEDS). This electricity price used is the average retail price for all end-users in each year between 1979 and 2012.

The preferred specification is shown in column 3 of Table A4 which controls for time and year fixed effects, state-level time-trends, and the unemployment gap (which is important to include as it seems to be absorbing some employment variation not controlled for in the state, year, and time-trend dummy variables). The data covers the period from 1979 to 2012. For this specification, the coefficient of employment on energy prices is -0.017. This implies that a 10 percent change in electricity prices reduces employment by 0.17 percent, or that a 5 percent increase in electricity prices (as forecast by the CPP regulatory impact assessment) will reduce employment by 0.085 percent, or just under 100,000 jobs.

As noted by Deschenes (2009), this is best interpreted as the short-run effect on employment of unanticipated increases in electricity prices. Electricity price changes that are fully anticipated and take some time before implementation should be expected to be significantly smaller.

Higher results are gained if the sample is cut off in 2008 (as is done in columns 4 to 7 of Table A4). Here, the coefficient estimates suggest job-losses of over 150,000 in the specification (column 6) that includes all other controls. It is unclear why including the latest five years of data changes the results to such a great extent, but it is regarded as more robust to proceed with including more data rather than less.

Finally, regressions that used state/industry cells as the unit of analysis are reported. The employment data let us examine 13 separate industrial sectors within states. Despite the larger sample size, the overall coefficient on state/industry employment in this larger panel never achieved statistical significance. Later sections focus just on manufacturing employment across states and do find significant and disproportionate job losses in this sector that are correlated with electricity price differences.

COMBINING THE VAR AND STATE-PANEL REGRESSION RESULTS

The two different regression techniques provide results that span most of the plausible variation identified in the introduction to this section. The results range from 20,000 to 100,000 in the preferred specifications, with 150,000 in the panel regression with the time-period truncated in 2008.

Lacking any better alternative, I average the results provided by each method to establish the point estimate of the employment impact of higher energy prices. This gives a net increase of 75,000 jobs (the average of 25,000 and 125,000). Further, given the sharp fadeout of negative employment impacts in the vector autoregression, the interpretation of state panel regression results as measuring the responsiveness of employment to unanticipated short-run electricity price changes, and the evidence that the long-run elasticity of demand with respect to electricity prices is much larger than the short-run elasticity, I can only be confident about these negative price effects for the first year examined in the regulatory impact assessment - 2020.

VII. TOTAL NET EMPLOYMENT IMPACTS

Table 4 provides the final tally on employment impacts, showing gross gains and gross losses by each employment channel: direct effects, indirect effects, and price effects.

The negative price effects are not large enough to swamp the positive net effect of tallying the direct and indirect job flows. The key driver of these positive net effects is the large increase in energy efficiency investments. These investments are large in direct scale (accounting for more than half of the total direct gross gains in 2020, and accounting for essentially all the gross gains in 2025 and 2030), and also tend to have higher-than-average employment multipliers as well. These energy efficiency investments also implicitly drive a large part of the generation response, as an overall decline in electricity use of roughly 11 percent is spurred by the rule relative to the baseline in 2035.

Table 4: Summing Up Employment Effects of Each Channel

	Gains			Losses			Net		
	2020	2025	2030	2020	2025	2030	2020	2025	2030
Direct	119,938	83,059	79,552	24,263	52,959	64,672	95,675	30,100	14,880
Indirect	353,210	257,778	239,342	88,656	181,526	229,880	264,554	76,252	9,462
Supplier	136,504	99,634	92,687	29,117	62,884	80,644	107,387	36,750	12,042
K-services	60,433	41,848	36,268	29,713	54,273	68,722	30,720	-12,424	-32,453
Induced, direct	72,723	55,477	54,058	13,237	28,358	34,056	59,486	27,118	20,002
Induced, indirect	72,664	52,718	48,639	14,511	31,528	40,849	58,153	21,190	7,789
Federal	3,230	2,404	2,281	616	1,330	1,664	2,613	1,073	617
State/Local	7,656	5,697	5,408	1,461	3,154	3,944	6,195	2,544	1,463
Direct +Indirect	473,147	340,837	318,894	112,918	234,486	294,552	360,229	106,352	24,342
Prices	0	0	0	-75,000	0	0	-75,000	0	0
Total	473,147	340,837	318,894	37,918	234,486	294,552	285,229	106,352	24,342
Note: Summary of all previous effects by channel									

In 2020, total net employment changes resulting from the rule total to an employment gain of 285,000 jobs. This net gain drops off rapidly in 2025 and 2030 but remains positive, assuming that price effects are no longer significantly impacting employment in 2025 and 2030.

SENSITIVITY CHECK ON ENERGY EFFICIENCY JOBS AND FULL-TIME EQUIVALENTS

The EPA regulatory impact assessment's estimates of jobs supported by energy efficiency investments include a caution that these are not expressed as full-time equivalents, while the other direct job flows are. This could potentially bias the estimate of jobs supported through these investments upwards. My primary estimate of employment changes has not adjusted the overall numbers for this caution, mostly because the gap between total and full-time equivalent employment in sectors heavily represented in energy efficiency investments (mostly manufacturing and construction) is very small. However, I did experiment with adjusting the jobs supported by energy efficiency investments downward by the economy-wide ratio of full-time equivalents to overall employment, with the results shown in Appendix Table A5. This adjustment leads to a roughly 10 percent reduction in jobs supported by energy efficiency investments, which in turn leads to direct plus indirect job gains in 2020 falling to roughly 330,000 (down from 360,000 reported in earlier results), and to small net job losses in these categories by 2030 (less than 15,000).

It is worth noting that in a well-functioning economy (i.e., one without substantial degrees of economic slack and one no longer stuck in the liquidity trap that has characterized much of the past six years in the American economy), any significant impact on economy-wide employment – either positive or negative – would likely be met by a countervailing response from the Federal Reserve. In a sense, the job of the Fed is precisely to make sure that the economy-wide employment response to any shock like the CPP is zero. However, the Fed's countervailing response may be imperfect, and it is useful to know which direction the Fed will have to push the economy following the implementation of the CPP. And, as I note below, the geographic distribution of gains and losses means that even if the Fed fully sterilized the national em-

ployment impacts of the CPP, impacts that differ across regions would remain.

VIII. COMPARISON OF JOB COMPOSITION OF GAINING VERSUS LOSING INDUSTRIES

In addition to changes in employment levels, policymakers may also be interested in changes in the composition of jobs spurred by labor market responses to the CPP. This section combines information from the BLS ERM and demographic and labor market data from the Current Population Survey (CPS) to predict the characteristics of workers that populate the jobs either displaced or created by the CPP.

I use the CPS to estimate the share of each industry's workforce by gender, race, educational attainment, union status, and wage-level. I then multiply these shares by the total number of jobs displaced or created by the CPP. I present the results separately for gaining and losing industries in Tables 5 and 6.

The broad summary of differences in job composition between gaining and losing industries can be summarized briefly: losing industries tend to have fewer workers with a four-year college degree (19.8 percent versus 29.8 percent) and yet have fewer low-wage and more middle-wage jobs. This is likely in part because jobs in Iosing industries are significantly more unionized than in gaining industries (19.8 percent versus 9.0 percent). Jobs in both gaining and losing industries have higher shares of male workers and white workers than economy-wide averages.

Table 5: Composition of Jobs in Gaining Industries

	Jobs Gained					Percentage of Jobs Gained					Economy-Wide Average (%)
	Direct	Supplier	Direct + Supplier	K-Input	Total	Direct (%)	Supplier (%)	Direct + Supplier (%)	K-Input (%)	Total (%)	
Totals	119,938	136,504	256,441	59,969	316,410	37.9	43.1	81.0	19.0	100.0	100.0
Gender											
Male	87,464	99,434	186,898	51,464	238,363	72.9	72.8	72.9	85.8	75.3	51.5
Female	32,474	37,069	69,543	8,504	78,047	27.1	27.2	27.1	14.2	24.7	48.5
Race											
Non-Hispanic white	84,543	99,750	184,293	39,743	224,036	70.5	73.1	71.9	66.3	70.8	66.2%
Non-Hispanic black	9,259	11,067	20,326	3,313	23,639	7.7	8.1	7.9	5.5	7.5	10.9
Hispanic	17,808	15,792	33,600	13,714	47,314	14.8	11.6	13.1	22.9	15.0	15.8
Asian (including Pacific islander)	6,700	8,048	14,748	2,330	17,078	5.6	5.9	5.8	3.9	5.4	5.3
Other	1,627	1,848	3,475	869	4,344	1.4	1.4	1.4	1.4	1.4	1.7

Table 5: Composition of Jobs in Gaining Industries (continued)

	Jobs Gained					Percentage of Jobs Gained					Economy-Wide Average (%)
	Direct	Supplier	Direct + Supplier	K-Input	Total	Direct (%)	Supplier (%)	Direct + Supplier (%)	K-Input (%)	Total (%)	
Age											
Less than 25 years	9,135	9,367	18,502	5,701	24,203	7.6	6.9	7.2	9.5	7.6	14.6
25–54	89,897	101,761	191,658	45,875	237,533	75.0	74.5	74.7	76.5	75.1	70.0
55 years and older	20,905	25,376	46,281	8,392	54,673	17.4	18.6	18.0	14.0	17.3	15.4
Union Status											
Covered	9,847	11,034	20,880	7,739	28,619	8.2	8.1	8.1	12.9	9.0	10.7
Not covered	110,091	125,470	235,561	52,230	287,791	91.8	91.9	91.9	87.1	91.0	89.3
Education											
Less than high school	11,201	8,911	20,112	9,923	30,035	9.3	6.5	7.8	16.5	9.5	9.7%
High school only	38,404	43,819	82,223	22,706	104,929	32.0	32.1	32.1	37.9	33.2	28.2
Some college	32,686	38,874	71,560	15,536	87,096	27.3	28.5	27.9	25.9	27.5	29.8
Bachelor's only	25,780	30,394	56,173	8,811	64,984	21.5	22.3	21.9	14.7	20.5	21.4
Advanced degree	11,867	14,506	26,373	2,993	29,366	9.9	10.6	10.3	5.0	9.3	11.0
Wage Quintile											
First (lowest)	10,609	9,311	19,921	5,360	25,281	8.8	6.8	7.8	8.9	8.0	20.50
Second	19,151	19,837	38,989	10,796	49,785	16.0	14.5	15.2	18.0	15.7	19.6
Third	26,581	30,669	57,251	14,156	71,407	22.2	22.5	22.3	23.6	22.6	20.0
Fourth	31,151	37,126	68,277	15,496	83,774	26.0	27.2	26.6	25.8	26.5	20.0
Fifth (highest)	32,444	39,560	72,004	14,160	86,164	27.1	29.0	28.1	23.6	27.2	20.0

Note: Job estimates do not include spending effects. Employment shares for each industry represent pooled data from 2009–2012.
Source: Author's analysis of Current Population Survey Outgoing Rotation Group microdata and BLS employment requirements matrices, as described in text.

Table 6: Composition of Jobs in Losing Industries

	Jobs Gained					Percentage of Jobs Gained					Economy-Wide Average (%)
	Direct	Supplier	Direct + Supplier	K-Input	Total	Direct (%)	Supplier (%)	Direct + Supplier (%)	K-Input (%)	Total (%)	
Totals	24,263	29,117	53,379	29,115	82,494	29.4	35.3	64.7	35.3	100.0	100.0
Gender											
Male	21,034	24,665	45,699	24,986	70,685	86.7	84.7	85.6	85.8	85.7	51.5
Female	3,229	4,452	7,681	4,129	11,809	13.3	15.3	14.4	14.2	14.3	48.5
Race											
Non-Hispanic white	20,907	24,521	45,428	19,295	64,724	86.2	84.2	85.1	66.3	78.5	66.2
Non-Hispanic black	1,210	1,748	2,958	1,608	4,566	5.0	6.0	5.5	5.5	5.5	10.9
Hispanic	1,315	1,842	3,158	6,658	9,816	5.4	6.3	5.9	22.9	11.9	15.8
Asian (including Pacific islander)	224	342	566	1,131	1,697	0.9	1.2	1.1	3.9	2.1	5.3
Other	606	664	1,270	422	1,691	2.5	2.3	2.4	1.4	2.1	1.7
Age											
Less than 25 years	1,760	1,978	3,738	2,768	6,506	7.3	6.8	7.0	9.5	7.9	14.6
25–54	17,941	21,668	39,609	22,273	61,881	73.9	74.4	74.2	76.5	75.0	70.0
55 years and older	4,562	5,471	10,032	4,074	14,107	18.8	18.8	18.8	14.0	17.1	15.4
Union Status											
Covered	5,559	7,025	12,585	3,757	16,342	22.9	24.1	23.6	12.9	19.8	10.7
Not covered	18,703	22,091	40,795	25,358	66,153	77.1	75.9	76.4	87.1	80.2	89.3
Education											
Less than high school	1,140	1,185	2,325	4,818	7,143	4.7	4.1	4.4	16.5	8.7	9.7
High school only	10,817	11,815	22,632	11,024	33,656	44.6	40.6	42.4	37.9	40.8	28.2
Some college	7,539	9,409	16,949	7,543	24,492	31.1	32.3	31.8	25.9	29.7	29.8
Bachelor's only	3,509	4,937	8,447	4,278	12,724	14.5	17.0	15.8	14.7	15.4	21.4
Advanced degree	1,257	1,770	3,027	1,453	4,480	5.2	6.1	5.7	5.0	5.4	11.0

Table 6: Composition of Jobs in Losing Industries (continued)

	Jobs Gained					Percentage of Jobs Gained					Economy-Wide Average (%)
	Direct	Supplier	Direct + Supplier	K-Input	Total	Direct (%)	Supplier (%)	Direct + Supplier (%)	K-Input (%)	Total (%)	
Wage Quintile											
First (lowest)	714	853	1,567	2,602	4,169	2.9	2.9	2.9	8.9	5.1	20.5
Second	1,944	2,317	4,261	5,241	9,503	8.0	8.0	8.0	18.0	11.5	19.6
Third	4,032	4,804	8,836	6,873	15,709	16.6	16.5	16.6	23.6	19.0	20.0
Fourth	9,072	10,291	19,363	7,524	26,887	37.4	35.3	36.3	25.8	32.6	20.0
Fifth (highest)	8,502	10,851	19,352	6,875	26,227	35.0	37.3	36.3	23.6	31.8	20.0

Note: Job estimates do not include spending effects. Employment shares for each industry represent pooled data from 2009–2012.
Source: Author's analysis of Current Population Survey Outgoing Rotation Group microdata and BLS employment requirements matrices, as described in text.

IX. SPECIFIC CHALLENGES POSED TO TRANSITION FROM LOSING INDUSTRIES

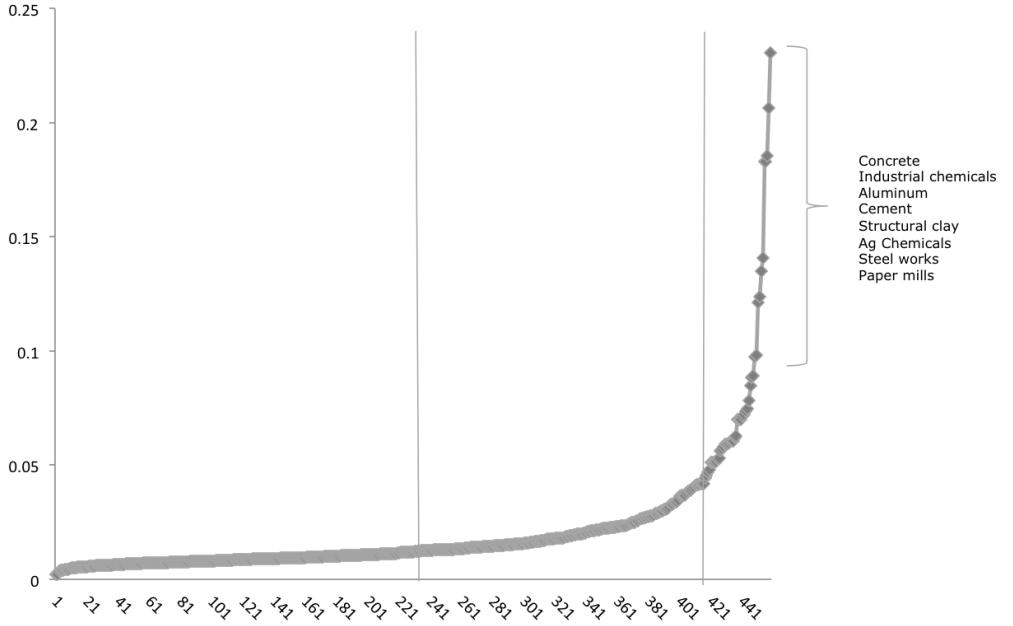
These indicators of job quality highlight some key of the challenges in managing the labor market transitions that are likely to result from the CPP. Specifically, workers displaced by the CPP tend to have less formal credentials than economy-wide averages and also skew older. Both of these characteristics correlate with lower re-employment probabilities and lower quality jobs when alternative employment is secured (Sum et al. 2011). Further, because jobs in losing industries pay higher-than-average wages even for a workforce that has fewer formal educational credentials, the expected wage-loss from displacement from these industries is expected to be higher.

Another transition issue comes from the disproportionate impact of job losses due to price effects on energy intensive, trade-exposed industries. As Figure 2 shows, there are a small number of manufacturing industries that have significantly higher energy cost shares than others, and so these industries may see a significant decline in their international competitive position if domestic policy (i.e., the CPP) made electricity significantly more expensive for them relative to the global competition.

I first examine whether or not manufacturing overall bears a disproportionate share of job losses stemming from price increases. Appendix Table A6 shows the results of the state/panel regressions examined earlier, but now with manufacturing employment as the dependent variable. In the preferred specification (column 2), the coefficient on electricity prices is larger than for overall employment (0.03 versus 0.017) and is statistically significant. Applying this coefficient result to the expected price change resulting from the CPP implies manufacturing job-loss of roughly 20,000, or about a fifth of the entire predicted job losses due to higher prices. Manufacturing employment is far below 10 percent of total employment, so this is clearly a disproportionate effect.

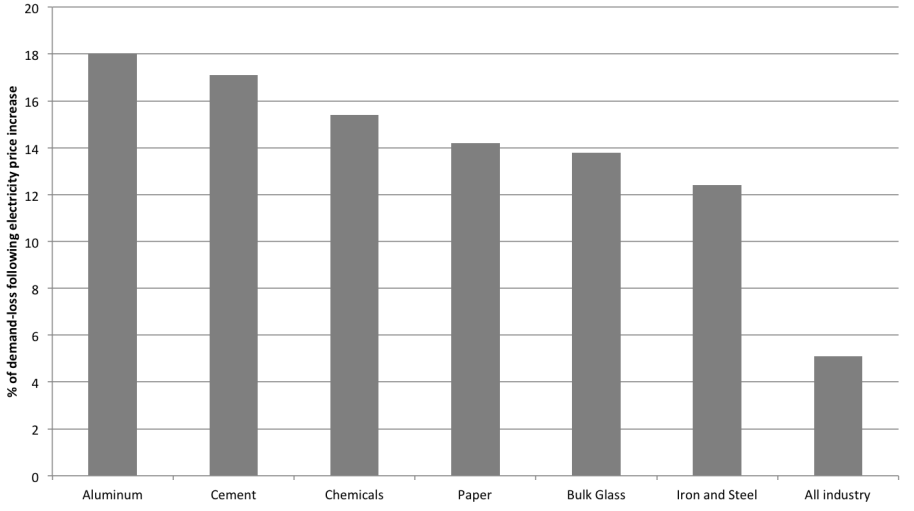
While manufacturing overall bears a disproportionate burden from price increases, this still leaves open the question of how much of this

Figure 2: Energy Cost Shares Highly Skewed - Even in Manufacturing: Energy Costs as Percent of Gross Output



Note: 445 NAICS manufacturing industries ranked in order of ascending energy cost shares. Vertical lines reading from left represent median and 90th percentile of energy cost intensity. Data on energy cost shares from the National Bureau of Economic Research (NBER) Productivity Database.

Figure 3: Trade-Exposed, Energy-Intensive Industries and Rising Cost of Emissions: Share of Demand-Loss Stemming from Increased Electricity Prices Accounted for by Rising Net Imports



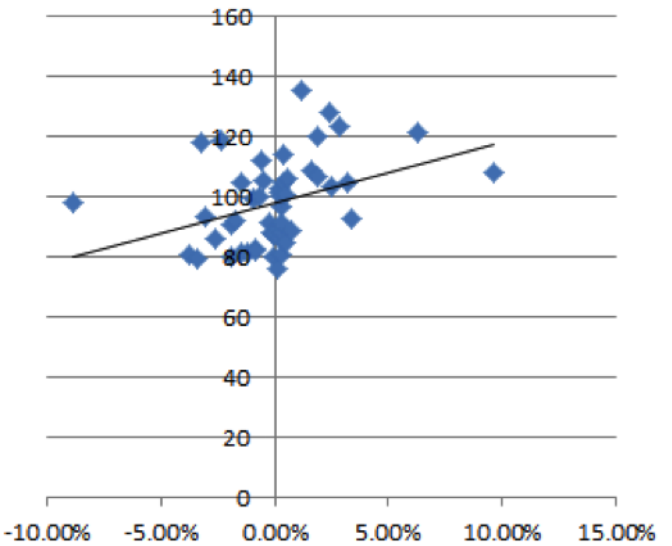
Note: Estimates taken directly from Aldy and Pizer (2014).

burden stems from eroded international competitiveness. Aldy and Pizer (2014) recently studied how much of output and employment declines stemming from increasing energy prices are the result of declining international competitiveness. Their results for overall manufacturing, as well as for some particularly energy-intensive sectors, are shown in Figure 3. For particularly energy-intensive industries, about one fifth of the entire output and employment decline stemming from higher energy prices is due to an eroded position in international markets.

Figure 4 highlights another concern related to transition challenges posed by the CPP. The drivers of job displacements in our analysis are the closure of coal-fired EGUs and the reduction in coal mining. The figure below adds together state employment in mining and a rough estimate of state employment in coal-fired EGUs and divides by total employment in the state, to gain a measure that can be thought of as potential exposure to job losses from the CPP.[6] It then plots this measure of potential exposure to job losses against each state's average per capita personal income. The key finding is that potential exposure to job displacements caused by the CPP seems likely to occur disproportionately in poorer states, which could hence have greater trouble finding resources to deal with the needed transitions. Because of this issue, and because the benefits of mitigating carbon emissions are national (indeed, global), this seems like a strong basis for federal policymakers to act to provide relief for states and communities that will have the largest necessary adjustments stemming from the CPP.

6 For the estimate of employment in EGUs by state, I allocate nation-wide employment in coal-fired plants by each state's share of national coal-fired electrical generation, using data from the Energy Information Association (EIA).

Figure 4: State PCI vs Disproportionate Share of Direct Employment Losses



Note: PCI stands for Pulverized Coal Injection.

TRANSITION POLICIES

The President's Fiscal Year (FY) 2016 budget proposal included support for managing the transition to the CPP. This – so far unapproved – proposal included a new $4 billion fund to encourage states to make faster and deeper cuts to emissions from power plants, and an additional $2 billion tax credit for power plants that capture their carbon dioxide. These recommended financial supports indicate that the Administration acknowledges that a key downside to addressing greenhouse gas mitigation through regulation rather than legislation is that it has the potential to create market distortions that may require additional intervention. A legislative solution would have provided the opportunity to bundle job-creating investments and transition assistance as a combined policy package that raised the cost of fossil fuel energy production and triggered displacements from "dirty" to "clean" power. The regulatory approach does not offer that same opportunity. The legislative defeat of greenhouse gas mitigation approaches in 2009 made the regulatory track the only available option, and so it is vital that policymakers concerned about jobs and incomes take steps to blunt any economic harm caused by job displacements spurred by the CPP.

There are many such steps that could be taken. Possibly the most important includes ensuring the viability of the health and pensions funds of coal companies. Many retirees rely on this income and they should not be punished for policy changes that make company pension obligations untenable. Currently the United Mine Workers (UMW) multi-employer pension fund is roughly $1 billion short of being in actuarial balance, driven predominantly by the rapid shrinkage of the current workforce relative to retirees. Another significant blow to the level of the current workforce could be disastrous for the pension fund. The Obama Administration's FY2016 budget includes transfers to the UMW pension fund through the Pension Benefits Guaranty Corporation to insure the solvency of the plan. The FY2016 budget also boosts transfers to health plans administered by the UMW to insure their viability.

Another set of tools would aim to ameliorate the decline in industrial competitiveness that could accompany the rule. For example, if other countries undertook measures to raise the price of carbon emissions, this would stem the competitiveness loss. Signing international agreements that raise the cost of greenhouse gas emissions would be an effective policy tool to mitigate the negative effects of labor market transitions stemming from the rule (and would further make the rule more effective in stopping global emissions by stopping carbon-intensive production from simply "leaking" abroad to other countries that do not regulate or price emissions). Until such an international agreement is reached, the US could unilaterally impose a "border-adjustment" tariff based on the carbon-intensity of the production of imports. Such a tariff would make the global reduction in emissions stemming from the rule larger, would blunt the employment dislocation in the US caused by the rule, and is in fact necessary for preserving the principle of non-discrimination in trade relationships.

X. CONCLUSION

The Clean Power Plan is the largest US undertaking to date aimed at mitigating the effects of global climate change. Given the vast importance of global climate change, this means that the impact of the CPP on economic, health, and environmental outcomes is likely to be quite

large – and this is indeed what the EPA's own impact analysis of the rule shows. Yet much debate about the CPP (and indeed about nearly all environmental regulations) has focused on the narrower issue of employment changes spurred by the rule. Economic theory suggests that such employment changes are likely to be modest (see Goodstein 1997 and Bivens 2011). This paper offers a comprehensive account of the economic channels through which the rule's effects could alter US employment. It finds that these effects are relatively modest in the near-term, and are more likely to provide a small net boost in employment by 2020. After this, the net impacts of the rule on employment converge quickly to zero – becoming almost completely insignificant by 2030.

While the effect of the rule on employment levels is small (and positive), the concentration of job dislocations and the composition of jobs in the losing industries suggest that policymakers should consider complementary policies in order to adjust and to blunt some of the less desirable outcomes of the rule. The clearest virtue to addressing climate change and greenhouse gas emissions through legislation is precisely that such complementary policies can be bundled together with the mechanisms that reduce emissions. This virtue does not accompany the current efforts to limit greenhouse gas emissions through regulation. While a regulatory approach can be effective in achieving the primary target of reducing greenhouse gas emissions, it needs to be complemented with policies that will ensure groups of workers and communities bearing a disproportionate burden of adjustment are fairly compensated for this.

XI. APPENDIX

EPA ESTIMATES OF JOB-CHANGES BY ACTIVITY

Appendix Table 1 reports directly the EPA estimates of employment change by activity spurred by the CPP. It breaks out these employment changes by three different employment flows: (1) Operations and maintenance (O&M) employment in the electrical power generating sector, (2) construction of new EGUs and heat rate improvements to existing EGUs and energy efficiency investments, and (3) extraction of fossil fuels. As with Table 1 in the main text, the employment flows shown below in Appendix Table 1 average the four different estimates provided in the regulatory impact analysis (State versus Regional and Option 1 versus Option 2).

Appendix Table 1 provides the averaged estimates for each employment flow (O&M, construction, and extraction) in each year examined by the regulatory impact analysis (2020, 2025, and 2030). In 2020, construction of natural gas generating capacity increases, as does renewable generation, heat-rate improvement investments, and energy efficiency investments. The sum of this short-run construction activity is 123,000 additional jobs relative to baseline. In later years, however, this pulling forward of natural gas and renewable construction actually depresses construction jobs (relative to baseline) in 2025 and 2030. Energy efficiency investments, conversely, continue to grow through 2030, though at a slower pace.

The large negative impact of the CPP on coal-sector employment is obvious in O&M employment. O&M employment in coal-fired EGUs falls by nearly 20,000 by 2020, and stays about that depressed relative to baseline all the way through 2030. This is obviously consistent with the significant decline in coal-fired generation identified in Table 1. In the near-term natural gas O&M employment rises, while O&M employment in oil and gas plants falls. Over longer horizons, O&M employment in all fossil fuel generation (including natural gas) falls relative to baseline. In 2020, the sum total of O&M employment losses is just under 20,000, and this rises to roughly 24,000 jobs by 2030.

Losses in coal extraction are large and significant in all three years – 12,600 in 2020 rising to 17,300 by 2030. Natural gas extraction actually rises slightly in the near-term – up by 5,050 in 2020 but by 2030 is lower than baseline by 2,000 jobs. Again, the CPP pulls forward natural gas related jobs and leaves them lower in later years.

Appendix Table 1: Direct Employment Changes Estimated by EPA RIA Relative to Baseline Under CPP, by Generating Source and Job Type

	Construction	O&M	Extraction	Total
2020				
Coal	0	-19,400	-12,600	-32,000
Natural Gas	6,775	1,825	5,050	11,450
Oil and Gas	0	-2,200	0	
Nuclear	0	0	0	0
Hydro	0	0	0	0
Non-Hydro Renewable	15,875	0	0	15,875
Energy Efficiency	67,900	0	0	67,900
Heat-rate improvements	32,450	0	0	32,450
Total	123,000	-19,775	-7,550	95,675
2025				
Coal	0	-17,800	-15,300	-33,100
Natural Gas	-25,225	-725	2,700	-25,150
Oil and Gas	0	-1,900	0	
Nuclear	0	0	0	0
Hydro	0	0	0	0
Non-Hydro Renewable	-5,750	0	0	-5,750
Energy Efficiency	94,100	0	0	94,100
Heat-rate improvements	0	0	0	0
Total	63,125	-20,425	-12,600	30,100
2030				
Coal	0	-18,950	-17,300	-36,250
Natural Gas	-34,400	-3,300	-2,000	-41,750
Oil and Gas	0	-2,050	0	
Nuclear	0	0	0	0
Hydro	0	0	0	0
Non-Hydro Renewable	-2,150	0	0	-2,150
Energy Efficiency	95,030	0	0	95,030
Heat-rate improvements	0	0	0	0
Total	58,480	-24,300	-19,300	14,880

Source: EPA RIA of CPP (2014).

CONSISTENCY CHECK ON EPA EMPLOYMENT ESTIMATES

The information provided in the regulatory impact analysis and summarized in Tables 1 and 2 allows us to undertake a quick consistency check to see if the numbers seem to be in concordance with what employment and generation estimates from other sources indicate. Specifically, from Table 1, we see that coal-fired generation falls by nearly 20 percent by 2020. Coal EGU O&M employment falls by 19,400 according to Appendix Table 1.

Appendix Table 2 combines data from the Bureau of Labor Statistics (BLS) Current Employment Statistics (CES) and the Energy Information Agency (EIA) to provide a consistency check on these estimates. The BLS CES data indicate that all fossil fuel generated electrical utility employment in 2013 was 100,000. The EIA data indicate that coal-fired EGUs generate a little over two-thirds of all fossil fuel generated electricity in 2013. So, if employment fell in strict proportion to generation, this would imply that a 20 percent reduction in coal-fired generation should only see employment losses of roughly 12,000-14,000 jobs. The fact that the CPP regulatory impact analysis instead forecasts nearly 20,000 jobs declining due to the 20 percent reduction in coal-fired generation implies that coal-fired EGUs – or at least those coal-fired EGUs that are likely to close in response to the CPP – are more labor-intensive than other fossil-fuel generated EGUs.

This same logic holds in reverse for the short-term changes in natural gas generation. The regulatory impact analysis indicates that natural gas-fired EGU generation increases by 15 percent by 2020. EIA estimates indicate that natural gas is roughly a third of all fossil-fuel generated electricity, so, if employment rose in proportion to generation, this would imply an increase in natural gas O&M employment of roughly 5,000 in 2020. The fact that the CPP regulatory impact analysis only forecasts a 2,000 increase in natural gas O&M jobs indicates that natural gas – or least the natural gas generation that increases due to the CPP – is less labor intensive than overall fossil fuel generation.

This implicit finding that coal-fired EGU generation is more labor intensive is largely in line with other data. The EIA data shows that levelized costs for fixed O&M (which is largely dominated by labor costs) is higher in coal-fired EGUs than (most) natural gas EGUs. And Wei et al. (2009) show that while fixed O&M employment in both coal and natural gas-fired plants is low compared to other forms of generation, coal O&M employment (per unit of generation) is higher than natural gas.

In short, the data on generation and direct employment impacts from the CPP regulatory impact analysis seem to be roughly plausible (the employment losses/gains are clearly the same order of magnitude and quite close to overall generation losses/gains) and the implicit relative rankings of labor intensity match other data.

Appendix Table 2: Employment Changes by Generation

	2013 Generation, EIA (%)	Actual 2013 employment (BLS), thousands	Actual 2013 employment (BLS), % share of total
Total Fossil Fuels	67.7	100.2	60.8
Coal	43.4		
Natural Gas	23.6		
Other Fossil Fuels	0.7		
All non-Fossil Fuel	32.3	64.7	39.2
Nuclear	20.0		
Hydro	8.0		
Non-Hydro Renewable	4.2		

MAPPING EPA EMPLOYMENT ESTIMATES INTO SPECIFIC INDUSTRIES

Appendix Table 3 maps the employment changes by economic activity identified above in Appendix Table 1 into specific industries that I can use to identify indirect impacts. Many of the employment changes identified in Appendix Table 1 are quite straightforward to slot into ERM industries. Coal mining job losses enter into sector 7 – Coal Mining. Natural gas extraction gains (in 2020) and subsequent losses (in 2025 and 2030) enter into sector 8 – Oil and Gas mining. O&M employment changes (both positive and negative) unfortunately (for the sake of precision) all have to enter the same sector, 12 – Electric power utilities.

Slightly more complex decisions must be made to determine which industries are the direct recipients of employment flows due to other effects. Energy efficiency, for example, is not the name of a single industry sector in the ERM. To apportion changes due to energy efficiency investments, I used the data provided by EPRI (2014). EPRI (2014) estimates the areas with the highest potential for achieving energy efficiency savings in the residential, commercial, and industry sector. I used the EPRI estimates of possible potential savings as weights to apportion the spending flow of investments in energy efficiency. For example, in their estimates for the residential sector, EPRI (2014) highlights the highest potential savings coming from the following categories: space cooling, electronics, water heating, lighting, household appliances. They have similar mappings into sectors for the commercial and industrial sectors. These categories match tightly to existing ERM categories, and I assume that these flows will be proportional to the amount of energy savings achieved through these investments estimated by the EPRI report. So, for example, if lighting accounts for 15 percent of energy savings in the residential sector, I apportion 15 percent of employment gains spurred by energy efficiency investments into the sector in the ERM that best approximates this (electrical lighting equipment).

For apportioning employment flows stemming from investments in electricity generation from renewable sources, I drew on estimates from Pollin et al. (2009), who undertake a detailed analysis of job-creation stemming from clean energy production, and provide a mapping of industrial spending associated with investment in renewable energy, based on surveys with industry professionals. I used these

mappings to assign direct employment flows stemming from renewable generation construction. Both solar and wind generation requires construction employment as the single largest input. The remaining inputs constitute a mix of manufactured goods and technical services, as shown in Table 4.

For apportioning employment flows to ERM industry that occur due to construction of natural gas capacity, I assume that a third of such flows go to construction jobs, a third to manufacturing of transmission equipment, and a sixth each to design services and fabricated metals.

Finally, for heat-rate improvements at existing EGUs, I assign the employment flows equally between EGU O&M jobs, ventilation and cooling equipment, power transmission equipment, and scientific and technical services.

Appendix Table 3: Indirect Employment Impacts by Economic Activity

ERM Industry Code	ERM Industry label	Job-Change		
		2020	2025	2030
EGU O&M plus Fuel Extraction				
7	Oil and gas extraction	5,050	2,700	-2,000
8	Coal mining	-12,600	-15,300	-17,300
12	Electric power generation, transmission and distribution	-19,775	-20,425	-24,300
	Total	-27,325	-33,025	-43,600
Energy Efficiency Investments				
15	Construction	9,480	13,138	13,267
67	HVAC equipment manufacturing	12,461	17,269	17,440
69	Engine, turbine, and power transmission equipment manufacturing	2,384	3,303	3,336
72	Communications equipment	551	763	771
77	Electric lighting manufacturing	30,388	42,114	42,530
78	Household appliance manufacturing	2,624	3,637	3,673
79	Electrical equipment manufacturing	2,775	3,845	3,883
136	Services to buildings and dwellings	7,238	10,031	10,130
	Total	67,900	94,100	95,030
Renewable generation investments				
15	Construction	4,445	-1,610	-602
44	Plastics product manufacturing	953	-345	-129
61	Machine shops: hardware	1,389	-503	-188
63	Fabricated metal	953	-345	-129
69	Engine, turbine, and power transmission equipment manufacturing	238	-86	-32
70	Machinery manufacturing	2,937	-1,064	-398
79	Electrical equipment manufacturing	1,389	-503	-188
80	Other electrical equipment and component manufacturing	1,627	-589	-220
126	Scientific research and development services	1,945	-704	-263
	Total	15,875	-5,750	-2,150

Appendix Table 3: Indirect Employment Impacts by Economic Activity (continued)

ERM Industry Code	ERM Industry label	Job-Change		
		2020	2025	2030
Heat Rate Improvement Investments				
12	Electric power generation, transmission and distribution	8,113	0	0
67	HVAC equipment manufacturing	8,113	0	0
69	Engine, turbine, and power transmission equipment manufacturing	8,113	0	0
125	Management, scientific, and technical consulting services	8,113	0	0
	Total	32,450	0	0
Natural Gas Generation Construction				
15	Construction	2,236	-8,324	-11,352
63	Fabricated metal	1,152	-4,288	-5,848
69	Engine, turbine, and power transmission equipment manufacturing	2,236	-8,324	-11,352
123	Design services	1,152	-4,288	-5,848
	Total	6,775	-25,225	-34,400

STATE BY YEAR PANEL REGRESSIONS OF ELECTRCITY PRICES AND EMPLOYMENT

Appendix Table 4 shows the results of a panel regression with the log of state employment as the dependent variable and the log of end-user electricity prices (and other relevant controls) as the independent variables.

Column 1 shows the results from this regression with year and state fixed effects included. Column 2 also includes a state-specific time-trend. Column 3 also includes a measure of the unemployment gap – the difference between the unemployment rate in a state in a given year and the average unemployment rate for that state over the entire sample period.

I note that higher results are gained if one cuts off the sample in 2008 (as is done in columns 4-7), with the coefficient estimates suggesting job-losses of over 150,000 in the specification (column 6) that includes all other controls. It is unclear why including the latest five years of data changes the results so much, but I prefer including more data rather than less.

Finally, I also ran regressions that used state/industry cells as the unit of analysis. The employment data allow us to examine 13 separate industrial sectors within states. Despite the larger sample size, the overall coefficient on state/industry employment in this larger panel never achieved statistical significance. Later sections look just at manufacturing employment across states and do find significant and disproportionate job losses in this sector that are correlated with electricity price differences.

Appendix Table 4: Regression Coefficients from State/year Panel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
State/year panel	-0.014**	-0.038***	-0.017***	-0.017*	-0.049***	-0.026***			
	(.008)	(.0054)	(.0044)	(.009)	(.0055)	(.0047)			
State/industry/year panel							-0.049	-0.044	-0.024
							(.042)	(.058)	(.058)
Predicted employment effect, short-run	81,453	221,088	98,908	98,908	285,087	151,270	-	-	-
Quadratic in year	yes	yes	yes	yes	yes	yes	yes	yes	yes
Year fixed effecs	yes	yes	yes	yes	yes	yes	yes	yes	yes
State fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
State-specific time trend	no	yes	yes	no	yes	yes	no	yes	yes
Industry fixed effect	-	-	-	-	-	-	yes	yes	yes
Industry-specific time trend	-	-	-	-	-	-	no	yes	yes
Unemployment gap	no	no	yes	no	no	yes	no	no	yes
Years	1979-2012	1979-2012	1979-2012	1979-2008	1979-2008	1979-2008	1990-2012	1990-2012	1990-2012
Obs	1,734	1,734	1,734	1,474	1,474	1,474	14,292	14,292	14,292

***, **, * denotes statistical significance at 1, 5, and 10 percent confidence levels, respectively. Standard errors in parentheses.
Note: Following method of Deschenes (2009), dependent variable is log of state employment. Independent variable of interest is log of end-use electricity prices by state. Employment data from the Current Employment Statistics of the BLS. Electricity price data from the State Energy Data System (SEDS) from the Energy Information Agency (EIA).

Appendix Table 5: Sensitivity Check - Assuming Energy Efficiency Employment Figures Expressed in FTES

	Gains, EE Adj for FT			Losses			Net			Multiplier	Net		
	2020	2025	2030	2020	2025	2030	2020	2025	2030		2020	2025	2030
Oil and gas extraction	5,050	2,700	0	0	0	2,000	5,050	2,700	-2,000	673.5	39,063	20,885	-15,470
Coal mining	0	0	0	12,600	15,300	17,300	-12,600	-15,300	-17,300	269.0	-46,495	-56,458	-63,838
Electric power generation, transmission, and distribution	0	0	0	11,663	20,425	24,300	-11,663	-20,425	-24,300	459.5	-66,423	-116,330	-138,400
Construction	15,213	1,890	-13	0	0	0	15,213	1,890	-13	173.9	41,668	5,176	-36
Plastics product manufacturing	953	0	0	0	345	129	953	-345	-129	238.8	3,227	-1,169	-437
Maching shops: hardware	1,389	0	0	0	503	188	1,389	-503	-188	151.4	3,492	-1,265	-473
Fabricated metal	2,104	0	0	0	4,633	5,977	2,104	-4,633	-5,977	227.5	6,891	-15,174	-19,575
HVAC equipment manufacturing	19,327	15,542	15,696	0	0	0	19,327	15,542	15,696	324.7	82,079	66,004	66,657
Engine, turbine, and power transmission equipment manufacturing	12,732	-330	-334	0	5,107	8,048	12,732	-5,438	-8,382	330.4	61,158	-26,120	-40,264
Machinery manufacturing	2,937	0	0	0	1,064	398	2,937	-1,064	-398	328.4	12,582	-4,557	-1,704
Communications equipment	496	687	694	0	0	0	496	687	694	341.8	2,189	3,034	3,064
Electric lighting manufactruing	27,349	37,902	38,277	0	0	0	27,349	37,902	38,277	328.2	117,098	162,281	163,885
Household appliance manufacturing	2,362	3,273	3,306	0	0	0	2,362	3,273	3,306	453.5	13,074	18,119	18,298
Electrical equipment manufacturing	3,886	2,958	3,307	0	0	0	3,886	2,958	3,307	225.8	12,662	9,636	10,774
Other electrical equipment and component manufacturing	1,627	0	0	0	589	220	1,627	-589	-220	268.8	6,001	-2,174	-813
Design services	1,152	0	0	0	4,288	5,848	1,152	-4,288	-5,848	144.7	2,818	-10,492	-14,308
Management, scientific, and consulting services	8,113	0	0	0	0	0	8,113	0	0	163.3	21,362	0	0
Scientific research and development services	1,945	0	0	0	704	263	1,945	-704	-263	231.4	6,444	-2,334	-873
Services to buildings and dwellings	6,514	9,028	9,117	0	0	0	6,514	9,028	9,117	130.6	15,024	20,821	21,027
Total	113,148	73,649	70,049	24,263	52,959	64,672	88,885	20,690	5,377		333,915	69,885	12,486

Appendix Table 6: Manufacturing Employment Regressions

	(10)	(12)
State/industry/year panel	-0.15***	-.03*
	(.04)	(.02)
Predicted employment effect, short-run	97,500	19,500
Quadratic in year	yes	yes
Year fixed effecs	yes	yes
State fixed effects	yes	yes
State-specific time trend	no	yes
Industry fixed effect	yes	yes
Industry-specific time trend	no	yes
Unemployment gap	no	yes
Years	1990-2012	1990-2012
Obs	1184	1184

***, **, * denotes statistical significance at 1, 5, and 10 percent confidence levels, respectively. Standard errors in parentheses.
Note: Following method of Deschenes (2009), dependent variable is log of state (manufacturing) employment. Independent variable is log of end-use electricity prices by state. Employment data from the Current Employment Statistics of the BLS. Electricity price data from the State Energy Data System (SEDS) from the Energy Information Agency (EIA).

XII. REFERENCES

Aldy, Joseph and William Pizer (2009). The Competitiveness Impacts of Climate Change Mitigation Policies. Pew Center on Global Climate Change.

Bivens, Josh (2003). Updated Employment Multipliers for the US Economy. EPI Working Paper #268.

Bivens, Josh (2011). A Life-Saver, Not a Job-Killer: EPA's Proposed "Air Toxics Rule" is No Threat to Job-Growth. EPI Briefing Paper #312.

Deschenes, Olivier (2012). "Climate Policy and Labor Markets" in Fullerton and Wolfram (eds.) The Design and Implementation of US Climate Policy. University of Chicago Press.

Electrical Power Research Institute (2014). US Energy Efficiency Potential Through 2035. http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001025477

Environmental Protection Agency (2014). Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants. http://www2.epa.gov/sites/production/files/2014-06/documents/20140602ria-clean-power-plan.pdf

Goodstein, Eban (1997). Jobs and the Environment: The Myth of a National Trade-Off. Economic Policy Institute.

Killian, Lutz (2008). "The Economic Effects of Energy Price Shocks." Journal of Economic Literature. Volume 46(4), pp. 871-909.

Maddala, G. S., Trost, R. P., Li, H., & Joutz, F. (1997). Estimation of short-run and long-run elasticities of energy demand from panel data using shrinkage estimators. Journal of Business & Economic Statistics, 15(1), 90-100.

Pollin, Robert, James Heintz and Heidi Garrett-Peltier (2009). The Economic Benefits of Investing in Clean Energy: How the economic stimulus program and new legislation can boost US economic growth and employment. Report jointly released by the Political Economic Research Institute and the Center for American Progress. https://cdn.americanprogress.org/wp-content/uploads/issues/2009/06/pdf/peri_report_execsumm.pdf

The Need to Strengthen Regulatory Enforcement

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New survey data show that the public wants fairer, tougher enforcement of existing laws and regulations. Seven in ten voters – with solid majorities across political party, gender, and geography – said better enforcement of laws and regulations is important. Voters also want tougher penalties, but the current enforcement system is characterized by underfunding, too few inspectors, and penalties that fail to deter violators from breaking the rules. The complexity of rulemaking has increased, and new hurdles have been imposed that delay efforts to improve public protections in a variety of arenas and combine to further weaken enforcement. Despite new partisan political efforts to further undermine regulatory structures, the survey data show there is a remarkably broad public consensus that we need tougher enforcement of existing laws and rules moving forward.

Regulations are the means by which laws and public policies are implemented. American University President Cornelius Kerwin describes rulemaking as "the single most important function" of government agencies and a "ubiquitous and indispensable means of responding to public challenges" (2003, p. xi, xii). They affect every aspect of life, yet few people understand how rulemaking occurs or its importance in ensuring our basic quality of life.

The premise of this article is that we need tougher enforcement. First, the article provides a brief overview of the achievements of the regulatory state, and argues that it has become increasingly difficult to maintain or to improve on past successes, as business interests have mobilized against new regulations and won changes in the regulatory process that make new rulemaking far more difficult than it was several decades ago. This "regulatory capture" by powerful special interests also has adverse effects on the enforcement of rules. When modest fines and negotiated settlements are simply viewed as part of the cost of doing business, the system fails to deter irresponsible business practices. Today's regulatory system is hyper-partisan, with busi-

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ness interests and conservatives promoting less regulation and enforcement.[1] We provide two examples that illustrate how the public suffers from this weakened, hyper-partisan regulatory system. We conclude by presenting new survey data showing that the public – reaching across party lines – agrees on the need for stronger, tougher enforcement. The survey data suggest the enforcement framework is a unifying opportunity; that is, an opportunity for finding common ground to improve the way regulatory enforcement is done.

I. THE REGULATORY STATE TODAY

We begin with an overview of the system of national standards and public protections established in the US over the past century, followed by a short description of the way anti-regulatory industry groups and their allies have worked to add numerous procedural hurdles to the rulemaking process. Through a focus on regulation and rulemaking, these groups have been successful over the last 40 years to weakened rules and the enforcement of public protections.

WHY REGULATION IS IMPORTANT

Regulations issued in the United States over the last century have made our country stronger, better, safer, cleaner, healthier, fairer, and more just. It is hard to imagine what our quality of life would be without the modern regulatory state and its dramatic achievements. Research has shown that regulations have:

- Made our food safer (Centers for Disease Control 1999);
- Saved tens of thousands of lives by making our cars safer (Steinzor & Shapiro 2010);[2]
- Made it safer to breathe, saving hundreds of thousands of lives annually (US Environmental Protection Agency 2011); [3]
- Protected children's brain development by phasing out leaded gasoline and dramatically reducing average blood levels (US Environmental Protection Agency 2000); [4]

1 The term "hyper-partisan" is used because the sides have staked out turf in such a way that there is little opportunity for compromise. For example, congressional hearings on regulatory issues have become platforms to promote a single point of view and a vehicle to dismiss minority perspectives. Conservatives and business interests that promote less regulation rarely meet with public interest groups that promote improved regulation. Each side strongly criticizes the other, often in hyperbolic terms.

2 NHTSA's vehicle safety standards have reduced the traffic fatality rate from nearly 3.5 fatalities per 100 million vehicles traveled in 1980 to 1.4 fatalities per 100 million vehicles traveled in 2006.

3 Clean Air Act rules saved 111,560 lives in 2000, 164,530 lives in 2010, and the EPA estimated that by 2020 they will save 237,380 lives annually. EPA air pollution controls saved eight million days of lost work and 1.2 million days of lost school in 2000. The equivalent numbers for 2010 are 13 million days of lost work and 3.2 million days of lost school, and the EPA estimates they will save 17 million work-loss days and 5.4 million school-loss days annually by 2020.

4 Environmental Proction Agency (EPA) regulations phasing out lead in gasoline helped to reduce the average blood lead level in US children ages one

- Empowered disabled persons by giving them improved access to public facilities and workplace opportunities through implementation of the Americans with Disabilities Act (National Council on Disability 2007);

- Guaranteed a minimum wage, ended child labor, and established limits on the length of the work week (Lardner 2011);[5]

- Saved the lives of thousands of workers every year (AFL-CIO Safety and Health Department 2014; Weeks & Fox 1983);[6]

- Saved consumers and taxpayers billions of dollars by facilitating generic competition for medicines (Troy 2007);[7]

- Protected the elderly and vulnerable consumers from a wide array of unfair and deceptive advertising techniques; and[8]

- For half a century in the mid-twentieth century, and until the onset of financial deregulation, provided financial stability and a right-sized financial sector, helping create the conditions for robust economic growth and shared prosperity (Stiglitz 2010; Kuttner 2008).

Despite the clear benefits of regulation in all aspects of public life, from health to employment to the economy, organized business interests continue to obstruct, delay, and weaken the establishment of new rules. Through different administrations and Congresses - controlled by both Republicans and Democrats - these corporate interests have helped to create administrative barriers to scale back funding for enforcement efforts and to weaken penalties for violators. While some degree of corporate push-back regarding restrictions on their decisions are to be expected, in the past few decades, corporate influence peddling has become more strategic (Powell 1971)[9] and more dominant as

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to five. Average concentrations of lead in the blood of children aged five and under fell 78 percent from 16.5 micrograms per deciliter in 1976-80 to 3.6 in 1992-94.

5 There are important exceptions to the child labor prohibition; significant enforcement failures regarding the minimum wage, child labor, and length of work week (before time-and-a-half compensation is mandated). But the quality of improvement in American lives has nonetheless been dramatic.

6 Deaths on the job have declined from more than 14,000 per year in 1970, when the Occupational Safety and Health Administration was created, to under 4,628 in 2012 (see AFL-CIO Safety and Health Department, May 2014). Mining deaths fell by half shortly after the creation of the Mine Safety and Health Administration (see Weeks & Fox, 1983).

7 Through regulations facilitating effective implementation of the Drug Price Competition and Patent Term Restoration Act of 1984 ("Hatch-Waxman"), including by limiting the ability of brand-name pharmaceutical companies to extend and maintain government-granted monopolies.

8 See 16 CFR 410-460 for regulations under the Federal Trade Commission.

9 The 1971 memo by Louis Powell for the US Chamber of Commerce was not focused specifically on regulation but on positioning the business commu-

the sheer number of lobbyists and campaign contributions has rapidly expanded.[10] As Drutman notes, the average number of lobbyists per company more than doubled from 1981 to 2004 (Drutman 2015).

II. TILTING REGULATORY OUTCOMES TO FAVOR BIG BUSINESS

According to federal law, a rule is "the whole or part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy..."[11] In other words, a rule or regulation is the vehicle used by government agencies to implement laws passed by Congress. Yet there are a number of ways that the system does not work, both in terms of efficiency and in terms of best protecting the public. This section will discuss the following tools that businesses and other special interests use to delay, to modify, or to stop regulation: 1) White House centralized reviews; 2) A more complex set of procedural requirements for agencies; 3) Exaggerated estimates of the financial costs to businesses; 4) Exaggerated estimates of job loss effects; and 5) Promotion of anti-regulatory legislation.

WHITE HOUSE CENTRALIZED REVIEWS

The Administrative Procedure Act (APA) of 1946 states that a rule must not be arbitrary, capricious, or unsupported by substantial evidence. And it must not overstep the agency's discretion or power; a rule derives from congressional authority.[12] Before an agency issues a final rule, it must be published in the Federal Register and, except in unusual circumstances, the agency must give the public an opportunity to comment and to consider those comments.[13]

The APA's notice and comment rulemaking requirements have not changed significantlysince it was passed, but President Reagan did make major changes to the rulemaking process through executive powers[14] establishing a cen-

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nity to have more influence over the policymaking process. That memo, however, provided the impetus for an ongoing commitment, starting in the early 1980s and strengthening in the 1990s, to propose and to support ideas that would shift the rulemaking process to the benefit of businesses.

10 For data about the rise of money in politics, see the Center for Responsive Politics' website at https://www.opensecrets.org/. The rise in money spent on lobbying and campaign contributions, combined with strong anti-regulatory messaging (see footnote 11), are key factors in shaping regulatory policies. Sympathetic Republicans and some Democrats have proposed regulatory reforms. When Republicans are in the majority, these proposals have a greater chance of moving forward. When Democrats are in the majority, success is often measured by stopping anti-regulatory legislation. When it comes to campaign contributions, there is seldom any benefit to elected officials for supporting progressive regulatory reforms.

11 Administrative Procedure Act of 1946, Pub. L. No. 79-404, 60 Stat. 237 (codified as amended at 5 U.S.C. §§ 551-83, 701-06, 801-08, 3105, 3344, 6362, 7562 (2000)).

12 Ibid. § 706.

13 Ibid. § 553.

14 An excellent resource on the regulatory process is Lubbers (2012), a guide that is more than 600 pag-

tralized White House regulatory review process. Under Executive Order 12291, agencies were required to submit their regulatory actions to the Office of Management and Budget (OMB), and, to the extent permitted by law, OMB was able to stop rules if "the potential benefits to society from the regulation [do not] outweigh the potential costs to society" (Executive Order 12291, Sec. 2(b)). This new process often substituted White House judgement for agency expertise, adding a new, highly-politicized step to the rulemaking process. It also elevated the importance of cost-benefit analysis as a tool in deciding whether a rule should proceed.[15] And, since the cost estimates often come from business, it provided a new way for business interests to shape the process. This White House centralized review process continues today.

MORE COMPLEXITY IN THE RULEMAKING PROCESS

A decade after the Reagan executive order (and other changes added by Reagan and George H. W. Bush), law professor Thomas McGarity (1992) wrote about an "ossified" regulatory system that stifled the ability of federal employees, chosen for their substantive expertise, to issue rules that reflect that expertise. A few years later McGarity wrote of the "paralysis by analysis" caused by the myriad new analytic requirements. He noted these new requirements were making it increasingly difficult to issue

es long. Lubbers notes that the APA has not changed although the use of informal rulemaking (e.g., notice and comment) has grown. He points out that since the 1970s, Congress has enacted requirements that "supplement or supersede the APA's provisions" and that since the Nixon administration, presidents have used executive orders to add requirements beyond those required by the APA (p. 3).

15 Cost-benefit analysis has increasing become the way of making critical policy decisions. When it comes to regulations, it presents two types of problems. Imposing presidential requirements, such as cost-benefit analysis, cannot legally displace the requirements in the authorizing laws, but can add a distraction. For example, under the Occupational Safety and Health Act, the law says, "The Secretary, in promulgating standards dealing with toxic materials or harmful physical agents under this subsection, shall set the standard which most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with by such standard for the period of his working life." In other words, standards must protect against significant risk, to the extent technologically and economically feasible, and the courts have held that cost-benefit analysis may not be used as the basis for these standards. Nevertheless, the cost-benefit requirements under presidential executive orders come perilously close to being decision criteria for whether to regulate, notwithstanding the criteria imposed in the authorizing statutes. Second, Ackerman and Heinzerling present a powerful argument on the dangers of cost-benefit analysis: "The basic problem with narrow economic analysis of health and environmental protection is that human life, health, and nature cannot be described meaningfully in monetary terms: they are priceless… Indeed, in pursuing this approach, formal cost-benefit analysis often hurts more than it helps; it muddies rather than clarifies fundamental clashes about values… [C]ost-benefit analysis promotes a deregulatory agenda under the cover of scientific objectivity" (2004, p. 10-11).

final rules (McGarity, 1996). Today "most academics and policymakers agree that the process is ossified and inefficient" (Johnson 2006, p. 61).

As an example of these hurdles, a 2000 study identified 110 requirements under 20 different laws, executive orders, and other policy pronouncements that agencies must follow to issue a rule (Seidenfeld 2000). Since then, additional requirements have been imposed. For some agencies, it now takes more than a decade to finalize a major rule. These changes have tilted regulatory outcomes toward business interests and away from the public's economic, health, safety, and environmental interests by focusing this process on unreliable cost estimates instead of the public benefits of regulations. For example, if a workplace safety rule requiring a lower exposure of workers to a harmful substance is delayed for years, the plant owners do not have to take any action to reduce the risks to workers in the meantime. But while the rule is delayed, workers still face potential health hazards, with little to no opportunity for recourse. Of all the requirements placed on regulatory agencies, the most contentious, time-consuming, and biased is the demand to compare the specific costs to the affected industry with the more diffuse benefits to public health, workers, or the environment. Costs are often provided by the regulated businesses and are regularly over-estimated. Benefits rely on estimates of the numerical value of a life (often "discounted") or the costs to families and the medical system of disease. Businesses' assumptions about what is actually valuable often determine the numbers they derive for these kinds of analyses.

EXAGGERATED ESTIMATES OF THE FINANCIAL COSTS TO BUSINESS

Anti-regulatory advocates continue to try to produce and to promote inflated estimates of the overall costs of regulation. For example, the Small Business Administration (SBA) commissioned research that included an aggregated annual cost of federal regulations in the US (Crain and Crain 2010). The Congressional Research Service, an arm of Congress, criticized the authors for combining 30-year-old academic studies with outdated agency estimates of costs. Moreover, agency studies presented cost estimates as a range, but the authors used only the highest cost estimates (Copeland 2011). The White House Council of Economic Advisors called the research "utterly erroneous" (Goolsbee 2011). Two economists who tried to replicate the findings concluded that the regression model was "so conceptually flawed and statistically fragile that its findings should be rejected" (Irons & Green 2011). Even the SBA ultimately distanced itself from the study (Small Business Administration 2010).[16] Nevertheless, industry groups and their allies, including those in Congress, continued to promote the "utterly erroneous" figure of $1.75 trillion as a measure of the costs of regulation; using it in press releases, congressional hearings, newspapers, articles, and speeches.

16 Ignoring the independent assessments, the National Association of Manufacturers, a business lobbying association, asked Crains to update their work using basically the same flawed methods, and not surprisingly reported that the cost of regulation had increased to over $2 trillion in 2012 (Crain & Crain 2014). Again, there was no estimate of the benefits.

In spite of the methodological challenges of comparing aggregate costs and benefits, the OMB is required by law to do so each year. Each year the report shows that aggregate benefits of regulations far exceed the aggregate costs (Office of Management and Budget 2014).[17] Even as agencies like the OMB highlight the benefits of regulation, industry continues to claim that the next regulation will unreasonably raise the cost of doing business and even cause businesses to shut down. In fact, American firms innovate creatively and quickly to adapt to new regulatory standards, and the costs of compliance are typically lower than estimated (Mouzoon & Lincoln 2011). Here are some examples of industry pushback citing prohibitively high costs of new regulation:

- The auto industry long resisted installing air bags, referring to a cost of more than $1,000 per car to do so. Internal cost estimates showed the costs would be $206 per car (Behr 1981), and the cost today is even lower. The National Highway Traffic Safety Administration estimates that air bags saved 2,300 lives in 2010, and more than 30,000 lives from 1987 to 2010 (2012).

- The tobacco industry told restaurants, bars, and small business owners that smoke-free dining rooms would diminish their revenue by 30 to 60 percent (Crane 2004). Numerous studies have found that smoke-free rules have had a positive or neutral economic impact on restaurants, bars, and small businesses (Crowther 2013).

- Industry projected that their costs of complying with acid rain rules would be $5.5 billion annually, eventually rising to $7.1 billion. Actual studies after implementation place costs at $1.1 billion to $1.8 billion per year (Pew Environment Group 2010).

- The chemical industry estimated it would cost $350,000 per plant to regulate carcinogenic benzene emissions, but soon after controls were established, the plants developed a new process substituting safer chemicals for benzene, reducing their costs to almost zero (Shapiro & Irons 2011).

EXAGGERATED ESTIMATES OF JOB LOSS EFFECTS

A long list of other regulatory examples demonstrate the unreliability of predictions from vested interests of the damage regulations will cause to business: from child labor prohibitions, to the Family Medical Leave Act, restrictions on asbestos use, limits on coke oven emissions, cotton dust controls, strip mining regulations, and vinyl chloride controls (Crowther 2013; Hodges 1997; Shapiro & Irons 2011). Impacted industries typically overestimate the job loss effects of regulatory compliance because they discount the impact of technological dynamism and over-estimate costs (Ackerman and Heinzerling 2004). In fact, regulation often spurs innovation and can reduce costs and create jobs over time (Ashford

17 According to the draft 2014 report: "The estimated annual benefits of major Federal regulations reviewed by OMB from October 1, 2003, to September 30, 2013, for which agencies estimated and monetized both benefits and costs, are in the aggregate between $217 billion and $863 billion, while the estimated annual costs are in the aggregate between $57 billion and $84 billion" (p. 1-2).

1985; 2011). Notwithstanding this evidence, the US Chamber of Commerce and other business lobbying groups have put forward for decades the case that regulatory protections will destroy jobs and the economy.[18]

PROMOTION OF ANTI-REGULATORY LEGISLATION

These arguments – and the campaign contributions that push them forward – have frequently proved compelling to politicians on both sides of the aisle. Since 2011, anti-regulatory legislation has been introduced at a rapid pace.[19] Led by Republicans, a number of bills designed to reduce regulatory oversight, workplace health standards, environmental and public health protections, and financial reforms have been introduced.

Most of these bills focus on the rulemaking process itself rather than on underlying enabling legislation like the Clean Air or Clean Water Acts.[20] In this way, politicians can avoid attacking popular legislation. Instead, they build upon negative stereotypes of "mindless bureaucrats" and make the debate an inside-the-beltway struggle over the power of Congress versus federal agencies and the president. Because the rulemaking process is already so complex and cumbersome, few observers in the media or the public fully understand the implications of proposed regulatory process reforms. The changes being put forth would add even more procedural hurdles; impose even tougher cost-benefit requirements; give industry interests more special access that is denied to the public; and allow courts rather than scientists and other experts to decide whether rules are justified.

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18 May 18, 1971, the New York Times reported: "The United States Chamber of Commerce warned today that antipollution laws could kill entire industries and that the Government should be ready to pay for the economic consequences." The New York Times. "Pollution Laws Called a Threat to Industries," UPI, May 18, 1971.

In January 1981, Donald M. Kendall, Chamber vice chairman and chief executive of Pepsico said, "We simply must get a handle on regulatory overkill, waste and confusion. The federal government has become a virtual correctional institute for business, and excessive regulation is really strangling small business." Beaver County Times. "Chamber Challenges Small Firms, AP, Jan. 14, 1981.

November 16, 2010, US Chamber President Thomas Donahue states, "Regulation is the vehicle by which some seek to control our economy, our businesses, and our lives – and left unchecked, it will fundamentally weaken our nation's capacity to create jobs and opportunity." Donohue, Thomas J. "Addressing the Challenges of a Nation at Risk," Speech to the US Chamber of Commerce Board of Directors, Nov. 16, 2010.

19 This anti-regulatory agenda is accelerated by the seemingly unlimited campaign cash unleashed by court decisions such as Citizens United v. FEC and a burgeoning army of corporate lobbyists.

20 As discussed above this does not rule out strategies to amend the organic statutes, such as Dodd-Frank. But we are now focusing on legislation that has impact across multiple laws without ever amending those organic statutes.

Besides preventing agencies from updating standards to reflect the latest scientific and medical research, this Congress is undermining the effectiveness of regulatory agencies in other ways. Through restrictions to regulatory agency budgets, policy riders on "must pass" legislation that limit agency authority, delays in approving presidential confirmation positions, and oversight hearings to criticize agency actions and personnel, congressional actions have limited the capacity for agency rulemaking activities.

SEDUCING AGENCY STAFF: REGULATORY CAPTURE

Trying to influence the staff at regulatory agencies has been an industry objective since the origins of protective rules. Businesses have long used a two-pronged strategy to influence regulatory agencies: attack and seduce. Large corporations, as set out above, complain about their regulators and the unfair burdens they impose. They frequently denounce regulators and attempt to restrict their authority, and to encourage their allies to do the same. Yet, at the same time, whenever possible, they seek to work closely with those regulators to moderate rules and to prevent aggressive regulatory enforcement.

Though long established, this seduction process is poorly understood outside Washington, in part because it conflicts with industry denunciations of regulation. But it is a central part of business' long game – to endure the early, reform period of a new agency, and then capture it – and absolutely crucial to business' success in undermining regulatory enforcement.

The process is called "regulatory capture," and has existed as long as the modern regulatory state. Judge Richard Posner defined regulatory capture as "the subversion of regulatory agencies by the firms they regulate" (2014 p. 49). And Carpenter and Moss define it thus: when "regulation, in law or application, is consistently or repeatedly directed away from the public interest and toward the interests of the regulated industry, by the intent and action of the industry itself" (2014 p. 13).

Regulatory capture in the US dates back to the 1880s and the creation of the first federal regulatory agency, the Interstate Commerce Commission (ICC), established to regulate railroad freight rates. The Attorney General at the time, a well-known former railroad worker, was once asked by his former boss to help kill the ICC. The Attorney General replied that the smarter approach would be "not to destroy the Commission, but to utilize it" to serve the interests of railroad industrialists, noting that over time the Commission will take the "railroad view of things" (Carpenter & Moss 2014, p. 6).[21]

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21 Attorney General Richard Olney responded to Charles E. Perkins, the president of the Chicago, Burlington, and Quincy Railroad, on Dec. 28, 1892: "The Commission … is, or can be made, of great use to the railroads. It satisfies the popular clamor for a government supervision of the railroads, at the same time that that supervision is almost entirely nominal. Further, the older such a commission gets to be, the more inclined it will be found to take the business and railroad view of things… The part of wisdom is not to destroy the Commission, but to utilize it".

Carpenter and Moss note that "Olney's letter, although certainly powerful, provides no direct evidence that the Commission did in fact 'take the business and railroad view of things.'" However, other experts, such as Marver Bernstein in *Regulating*

The most extreme and remarkable recent example of regulatory capture occurred at the now renamed and reorganized Mineral Management Service,[22] the federal agency in charge of regulating oil and gas extraction. The regulators were literally sleeping with those they were supposed to regulate. A series of Department of the Interior Inspector General reports found a pervasive "culture of ethical failure" with widespread conflicts of interest. The agency's royalty collection department had "a culture of substance abuse and promiscuity" (Savage 2008). This episode cost taxpayers billions of dollars in uncollected royalties, and enforcement failures have been widely attributed to the BP oil well explosion in the Gulf of Mexico, potentially the worst environmental disaster in US history.[23, 24]

THE REVOLVING DOOR

The "revolving door" is a key cause of regulatory capture: industry pays much higher wages than the public sector and often hires friendly regulators away from government. This makes last week's regulators next week's lobbyists. Disgraced former lobbyist Jack Abramoff made this point about congressional staff when he noted that offering the possibility of a future lobbying job was one of the most effective corrupting tools available (Abramoff 2011a; Abramoff 2011b). The same can apply with regulators, although the future job may not be as a lobbyist but rather another high-paying position.

Notwithstanding recent reforms by the Obama Administration, the revolving door continues

Business by Independent Commission (Princeton University Press: NJ 1955, pg. 265), Samuel P. Huntington in "The Marasmus of the ICC: The Commission, the Railroads, and the Public Interest," Yale Law Journal, 1952, 614:467-509, and Thomas Frank, "Obama and 'Regulatory Capture'," Wall Street Journal, June 24, 2009, available at: http://www.wsj.com/articles/SB124580461065744913 point to the ICC as a leading example of capture.

22 Now called the Bureau of Ocean Energy Management, Regulation, and Enforcement.

23 "For too long, for a decade or more, there has been a cozy relationship between the oil companies and the federal agency that permits them to drill. It seems as if permits were too often issued based on little more than assurances of safety from the oil companies. That cannot and will not happen anymore." President Barack Obama, May 14, 2010, at https://www.whitehouse.gov/blog/2010/05/14/relentless-efforts-stop-leak-and-contain-damage.

24 While few would argue that MMS was "captured," some have noted that the reasons it became captured are quite complicated and that "MMS's capture might be less important in explaining the Deepwater Horizon tragedy…" noting additional factors also contributed (Carrigan 2014, p. 289). Even if accurate, it is still true that capture contributes to problems such as industrial accidents.

to spin. A recent report from the Project on Government Oversight (POGO) highlights the pervasiveness of the problem at one agency, the Securities and Exchange Commission. POGO found that "from 2001 through 2010, more than 400 SEC alumni filed 2,000 disclosure forms saying they planned to represent an employer or client before the agency" (Smallberg 2013, p. 2). And those disclosures "are just the tip of the iceberg, because former SEC employees are `required to file them only during the first two years after they leave the agency" (Smallberg 2013, p. 2). The report quotes a spokesperson from investment firm T. Rowe Price, who argues: "We strongly believe that having people with industry experience work for a regulator and having people with a regulatory background work in the industry benefits both sides as well as investors" (Smallberg 2013, p. 5).

It is easy to see the merits of the revolving door from the perspective of regulated companies. Agency staff understand how industry works and can give insights into how the regulating agency will respond to company actions. But from the public's viewpoint, former regulators turned lobbyists are exploiting insider information and relationships to give their new employers special advantages that others do not have (McGarity 2013).

III. REGULATORY ENFORCEMENT TODAY: THE RESULTS OF UNDER-INVESTMENT

For several decades, we have seen a systematic underinvestment – both in terms of funding and personnel – in regulatory enforcement. This has occurred despite new scientific evidence demonstrating a number of new and ongoing public health and safety risks, from exposure to industrial toxins to more widespread contamination of our food supply. For example, in 2010, Congress passed the Food Safety Modernization Act which gave the Food and Drug Administration (FDA) new mandates and oversight authority to protect the food supply. Six months after passage, control of the House shifted to Republicans and the FDA saw its budget reduced by $87 million – a sizable reduction of 10 percent. The FDA is responsible for regulating at least 80 percent of the country's food supplies – everything except meat and poultry. It oversees over 82,000 domestic food producers, more than a quarter of whom are considered "high risk." Yet FDA inspectors visited only 6 percent of these production facilities in 2011; only 44 percent were inspected between FY 2004 and FY 2008 (Steinzor 2014, p. 191).

Staff. The US Department of Agriculture (USDA) passed a rule in 2014 that reduces the number of inspectors in poultry processing plants, despite the high risk of salmonella and other bacteria in processed chickens. Federal poultry inspectors are required to examine birds on site as part of the production process. However, the poultry industry is advocating for a rule change that will reduce the number of federal inspectors on site by 40 percent and speed up the production lines in poultry processing plants (Kindy 2014), even though an estimated 25 percent of chicken parts and almost half of all packaged ground chicken have some level of salmonella contamination (Charles 2015).

Fines. The capacity of the Occupational Safety and Health Administration (OSHA) to carry out its mission has also been compromised in recent years. OSHA had fewer health and

safety compliance inspectors in 2011 than in 1981, yet the number of workplaces doubled to 9 million from 4.5 million, and the number of workers rose to 129.4 million from 73.4 million over the same period.[25] This means that the ratio of inspectors to workplaces fell by more than half: there is now only one inspector for every 4,300 workplaces; previously, there was one per 1,900 workplaces. Federal OSHA inspectors – at current staffing levels and workloads – would need between 131 and 136 years to inspect every workplace in America (Schwellenbach 2013). Theoretically, workers at these worksites have the legal right to raise job safety and health concerns, but employees who report hazards or violations often face retaliation or dismissal. Current legal whistleblower protections do not protect them from employer retaliation (Weatherford 2013). Financial penalties are not an effective deterrent either: fines for workplace violations involving a substantial probability of death or serious harm averaged $1,895 in fiscal year 2013 (AFL-CIO Safety and Health Department 2014, p. 76).

Increasingly, companies appear to regard fines for violating regulations as "the cost of doing business" (Steinzor 2014, p. 2 & 46). In her book on industrial catastrophes, Steinzor argues that corporate executives are not held accountable, noting that too often senior management "focused on profitability at the expense of safety" (2014, p. 6). Additionally, there is a tendency by prosecutors to avoid criminal prosecution by taking "the route of least resistance, bringing civil cases against corporations and settling for amounts less than the compliance costs the company avoided by breaking the law" (Steinzor 2014, p. 6).

Not only is overall enforcement weak, but when issues are resolved through out-of-court settlements, unless the agreement specifies otherwise, the fines corporations pay are deductible from federal taxes as a business expense. For example, BP, which was found "grossly negligent" for its role in the Deepwater Horizon disaster, has to date paid nearly $40 billion to clean up the environmental damage caused by the spill, to pay penalties in connection with the deaths caused by the Deepwater Horizon explosion, and to compensate local communities for widespread pollution. However, about 80 percent of the total payments made thus far qualify as "ordinary and necessary business costs," allowing BP to pay a total amount which is at least $10 billion lower than the stated costs (Cohen, 2015).

Since the Clinton years, the Department of Justice has been willing to negotiate "deferred prosecution agreements" that allow a company to not admit guilt; instead, the company simply promises to behave better or to mitigate the violation during a probationary period and pay a fine. Law professor Brandon Garrett created a database of corporate prosecutions to review the scale and scope of deferred prosecution agreements in corporate cases. He found more

25 According to data monitored by the AFL-CIO: The highest number of OSHA inspectors was in 1980 (1,469) at the end of the Carter administration. They began to decline in 1981 under Reagan. In 1981 there were 1,287 inspectors. This fell to 999 inspectors in 1987. In 1988, in the last year of Reagan there was an increase to 1,153 inspectors but that is because California gave up its State OSHA plan and federal OSHA had to hire federal inspectors to provide coverage. In 2011, there were 1,059 inspectors and has declined to 994 in 2013.

than 300 in the past decade, many involving large, publicly traded companies (Garrett 2014). He also found that the agreements were vaguely written, largely unmonitored, and often leave little role for the courts. Former federal prosecutor Dan Richman told NPR that these agreements have not stopped companies from becoming repeat offenders (Zarroli 2015).

TWO EXAMPLES OF ENFORCEMENT FAILURES

Two recent examples – a chemical spill in West Virginia and financial reform rules – demonstrate: (a) the consequences of weak regulations and enforcement; (b) the influence of powerful special interests; (c) how regulatory capture influences the culture of government regulators; and (d) how regulatory progress can be undone – even with strong public support for action.

ELK RIVER CHEMICAL SPILL

In the early hours of January 9, 2014, a chemical foaming agent used by the coal mining industry to clean and process coal began leaking from an aboveground storage tank north of Charleston, West Virginia. By the end of the day roughly 10,000 gallons of crude MCHM (4-Methylcyclohexanemethanol), whose health effects are largely unknown (Ward 2014a), leaked into the Elk River, just upstream from the Kanawha Valley Water Treatment facility which provides water to residents of nine counties in the state and all of Charleston.

Early in the day, the West Virginia Department of Environmental Protection sent a crew to a Freedom Industries site where they discovered the leaks in the storage tank and the containment area (Ward 2014b). They followed a trail of the liquid, which was pushing through a containment wall and down a slope where it disappeared beneath the ice covering the Elk River. Throughout the day Freedom Industries, the owners of the water treatment facility, and government authorities provided conflicting information about the safety of the drinking water.

By the end of the workday, the treatment facility had warned 300,000 residents not to drink or to use their tap water for bathing, washing hands, brushing teeth, or cooking (Bernstein, L. 2014). At least 600 people checked themselves into local hospitals, complaining of rashes, nausea, vomiting, abdominal pain, and diarrhea (Atkin 2015). Schools were closed, restaurants locked their doors, and hotels refused reservations. The do-not-use order lasted five days, but some residents said they could not drink or bathe in their water for more than a week, and traces of the MCHM were found in the water six weeks later (Atkin 2015).

It soon became clear that oversight at the Freedom Industries facility was minimal. The US Chemical Safety Board report regarding the incident said it had "thus far found no record of a formal, industry approved inspection performed on any of the chemical storage tanks at Freedom Industries prior to the massive leak which occurred on January 9, 2014" (2014). In general, the facility "was subject to almost no state and local monitoring," because it was used primarily for storage rather than manufacturing or processing (Berzon & Maher 2014). Because MCHM was exempt from federal and state chemical safety regulations (Weatherford 2014), the water treatment plant did not even know the chemical was on the site upstream, leading to inadequate emergency response plans (RT.com 2014).

In the aftermath of the leak, the West Virginia governor and state legislature began crafting a bill to address the situation. The governor convened a meeting of "the stakeholders," which included the Chamber of Commerce, the Oil and Gas Association, and the Coal Association, but no citizens' or environmental groups. After the meeting, the West Virginia Manufacturers' Association provided language for various exemptions to the bill. When it came time for a legislative hearing on the bill, regulators could not justify all the exemptions written into it. "They didn't have any idea why things were in there," Ken Ward Jr., a reporter for the West Virginia Gazette, said. "It's so ingrained in the way the legislature works that most of the people that cover the State House are kind of immune to how outrageous that is" (Osnos 2014).

Even in West Virginia, a state with a culture of lax enforcement and a business-friendly legislature, the spill bill moved quickly and some of the exemptions businesses sought were dropped. The bill passed unanimously, with no industry opposition.[26] The bill was signed into law on April 1, 2014 and officially took effect on June 6, 2014. The law requires an inventory and registration of aboveground storage tanks, new standards for minimizing future accidents, tank-specific emergency response plans, and gives inspection and enforcement authority to the state. It also requires large water utilities to install equipment to monitor water quality for certain contaminants (or to demonstrate why such monitoring is not feasible), and to establish emergency protection plans.

Yet one year and one state election after the Freedom Industries leak, industry is balking at the requirements of the new law. Bills have been introduced that would exempt "roughly 84 percent of tanks in the state from stricter oversight" (Maher 2015). Another analysis says less than one percent of chemical storage tanks in the state – just 90 – would be regulated under the new bills (Hansen, Betcher, Stroud, and Rosser 2015, p. 1). According to the *Wall Street Journal*, "Now, some in the state Legislature, which is Republican-controlled for the first time in 83 years, and Gov. Earl Ray Tomblin, a Democrat who signed the original legislation, say the provisions requiring new permitting, leak-detection systems, and inspections for tanks may have gone too far" (Maher 2015).

"The special interests who seek to dismantle our water protections know that when the crisis has passed, and people go back to attending to their everyday lives, it's easy to lose sight of what's at stake," Angie Rosser of the West Virginia River Coalition said. "We know from history, water protections will backslide when we're not paying attention" (Ward 2015).

FINANCIAL REFORM

A second example of weak regulatory enforcement examines the business-friendly environment inside the Federal Reserve, and ongoing efforts by Wall Street interests to reduce regulatory oversight now that the Great Recession is over. Most experts agree that deregulation, lax enforcement, and extremely risky financial products were key factors in the financial collapse of 2008 (The Economist 2013; Friedman 2011). The response was passage of the Wall

26 It was two bills rolled into one. See Senate Bill 373, which includes the Aboveground Storage Tank Act §22-30 and the Public Water Supply Protection Act §22-31.

Street Reform and Consumer Protection Act, commonly called Dodd-Frank, and efforts to change the culture between regulators and the banks. The example that follows demonstrates the challenges in trying to change this enforcement culture.

Dodd-Frank[27] provided more powers for regulators to "communicate in real time with one another and watch for problems ahead" (Dodd 2012) as well as oversee the biggest banks, credit rating agencies, hedge funds, and derivatives. It established a new watchdog – the Consumer Financial Protection Bureau – whose purpose is to protect consumers from abusive and deceptive financial practices. It also created the Volcker Rule, which prohibits banks from using depositors' money to gamble in the stock market.

Dodd-Frank did not pass without significant resistance from the financial sector. According to one analysis, nearly 1,000 lobbyists worked on legislative proposals related to derivatives regulation; opponents of reform outnumbered reformers by an 11 to one margin (Cohen & Taylor 2010). More than 900 former government officials lobbied for the financial industry in 2009, including more than 70 former members of Congress (Public Citizen 2009). After the legislation passed, Scott Talbott, the chief lobbyist for the Financial Services Roundtable, a group representing 100 of the country's largest financial institutions, called it "halftime," making it clear the industry would try to prevent its implementation (Rivlin 2013).

Even before Dodd-Frank went into effect, many bank regulators took a hard look at their own behavior, since it was clear they shared blame for the meltdown. For example, the Federal Reserve Board of New York gave Columbia University finance professor David Beim unlimited access to people and files in the institution. He found that the "New York Fed had become too risk-averse and deferential to the banks it supervised. Its examiners feared contradicting bosses, who too often forced their findings into an institutional consensus that watered down much of what they did" (Bernstein 2014).

In response, the New York Fed agreed to hire more aggressive investigators. One of these, Carmen Segarra, lasted only seven months before being fired. During her tenure, however, Segarra secretly recorded approximately 46 hours of audio from New York Fed meetings that reveal a continuing culture of deference to big banks. For example, when Segarra was asked to review the conflict of interest policy of Goldman Sachs and to assess whether it met federal standards, she found it wanting. She has tapes of her boss trying to get her to change her conclusion.[28] Shortly after that confrontation, Segarra was fired.

27 There are numerous summaries of Dodd-Frank, several of which are identified on the Americans for Financial Reform website at http://ourfinancialsecurity.org/current-issues/dodd-frank-act/. See also Morrison & Foerster. The Dodd-Frank Act: A Cheat Sheet, at http://media.mofo.com/files/Uploads/Images/SummaryDoddFrankAct.pdf. Also Koba, Mark. (May 11, 2012). Dodd-Frank Act: CNBC Explains, CNBC, at http://www.cnbc.com/id/47075854#.

28 Bernstein (2014) reports that ProPublica sent the conflict of interest policy to two legal and compliance experts. "Each said Goldman's Code of Conduct would not qualify as a firm-wide conflicts of interest policy as set out by the Fed's guidance."

As Senator Elizabeth Warren noted, the audio tapes "indicate the banks – not the Fed – are in charge. Congress can keep making the rules tougher and tougher, but it won't make an ounce of difference if the regulators won't enforce those rules" (2014).

The financial industry's power continues to shape policy discussions and outcomes. In 2014, Wall Street contributed a total of $184 million in the 2014 midterm elections – a $75 million increase over 2010, the last non-presidential election (Sugden 2015). And Wall Street spent $98.6 million lobbying Congress in 2014.[29] By mid-2014, 30 bills aimed at chipping away at aspects of Dodd-Frank had been introduced in the House during the 113th Congress (Bennett 2014). The chair of the House Financial Services Committee, Rep. Jeb Hensarling (R-TX), publicly stated: "We can never, ever accept a Dodd-Frank world, nor should we" (Hensarling 2014).

Wall Street's plan to enervate Dodd-Frank is straightforward: pass free-standing bills in the GOP-controlled House, then tie the provisions as amendments to must-pass legislation. Gretchen Morgenson (2015), a New York Times financial columnist described the strategy as, "First, seize on complex and esoteric financial activities that few understand. Then, make supposedly minor tweaks to their governing regulations that actually wind up gutting them."

That strategy gained national attention as Congress tried to pass a government spending bill in December 2014, essential to keeping government open (Schroeder & Cirilli 2014). Republicans attached a rider to the bill that waived a Dodd-Frank provision set to take effect in 2015. Dodd-Frank required large banks to separate trades in financial derivatives from traditional bank accounts, which are insured by the federal government through the Federal Deposit Insurance Corporation. The waiver again makes taxpayers responsible for bank losses. Even though some members of Congress tried to stop the rider, it passed as part of the spending bill (Kim 2014).

Reacting to the 2014 midterm elections, the Center for Responsive Politics said, "With the GOP in charge in both the House and Senate, Wall Street's investments [in the 2014 elections] are likely to show good returns" (Sugden 2015). And in the first months of the 114th Congress, Wall Street exercised its muscle, and the House passed "technical fixes" and "relief for small banks" – to slow the enforcement of Dodd-Frank and to weaken its regulation and enforcement of financial services companies.

Wall Street has also been proposing ways to reduce the "burdens" of stress tests on banks (designed to prevent them from taking on more risk than they can manage), undo mortgage restrictions, and cut other regulations to "help small banks." At the same time, Republicans have asked for cost-benefit analysis of the direct and indirect costs of new financial rules – a task economists say is impossible. They are also likely to cut the budget of financial regula-

29 See http://www.opensecrets.org/lobby/indusclient.php?id=F07&year=2014. This is a subset of the financial sector and excludes the banks. The more common reference is to finance, real estate, insurance (FIRE), which is admittedly overbroad: http://www.opensecrets.org/lobby/indus.php?id=F&year=

tory agencies, especially the Consumer Financial Protection Bureau (Finkle 2015).

Unregulated financial institutions brought the US and world economies to the brink of another Great Depression. Europe is still trying to recover from its financial crisis. Trillions of dollars of housing equity disappeared. Tens of millions of Americans lost their homes and jobs. The generation entering the labor market in the past eight years will be "scarred" for life. Public anger ran deep. But even before the crisis dissipated, powerful special interests went to work to undermine the new safeguards put in place to prevent another financial collapse.

IV. WHAT DOES THE PUBLIC THINK? A SURPRISING PERSPECTIVE

Given the weak enforcement structure, the authors of this paper decided to assess public attitudes about enforcement of laws and regulations. An initial review of the extant literature found little information on the subject. Lake Research Partners was asked to conduct a national survey and a pair of focus groups on voters' attitudes toward enforcement.[30]

The survey data reveal that, with near unanimity, voters nationwide believe there should be increased enforcement of laws and regulations in the US.[31] Voters respond with similar support and intensity whether increased enforcement is defined as "commonsense," "fairer, more equal," "proper," or "tougher." Across these various semantic permutations, 87 percent of voters agree that we need more robust enforcement of laws and regulations. (See Figure 1.)

Strong regulatory enforcement is far from a partisan issue – 89 percent of Democrats, 85 percent of Republicans, and 87 percent of Independents support fair and tough enforcement of the rules. This support for enforcement also traverses regional, generational, educational, and racial lines. While the question of how much regulation is enough remains a highly polarized issue, these data indicate that views on enforcement do not split along party divides. This suggests enforcement is a useful framework for moving forward in the contested regulatory space.

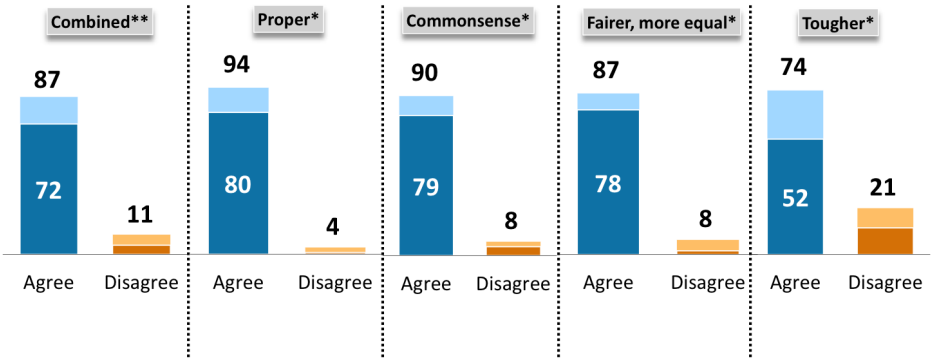
In fact, engaging a debate over this issue, using the argument that increased enforcement is a costly, big government job-killer, does little

30 Lake Research Partners designed and administered this survey, which was conducted by telephone using professional interviewers; the full report is available at http://www.sensiblesafeguards.org/assets/documents/reg-enf-poll-results-presentation-2014.pdf. The survey reached a total of 700 likely 2016 General Election voters nationwide. The survey was conducted July 21st – 28th, 2014. The margin of error for this poll is +/-3.7percent. Two focus groups were also designed, conducted, and moderated by Lake Research Partners. The focus groups were located in Columbus, Ohio and took place on June 3, 2014.

31 Seventy-one percent of voters believe increased enforcement of national regulations is a good thing (49 percent strongly). The percentage jumps to 74 percent when discussing state regulations (55 percent strongly). For both national and state regulations, this solid majority cuts across political allegiance, geography, gender, and employees in small and big business.

Figure 1: Enforcement of Our Laws and Regulations

Do you agree or disagree with this statement: we need _____ enforcement of our laws and regulations in the U.S.? And do you feel that way strongly or not-so strongly



Darker colors indicate intensity.
*Asked to ⅓ of sample
**Combined results

to diminish support for greater enforcement. After voters hear arguments for and against, 77 percent agree there is a need for tougher enforcement (including 56 percent who feel that way strongly). Just 18 percent of voters disagree. The text of the arguments is included in Table 1.

Despite the decades-long attack on regulations and regulatory agencies described in this paper, perceptions of the regulatory agencies tested in this study are by-and-large positive, with majorities of voters – including majorities of Republicans – expressing favorable opinions of the FDA (58 percent), the USDA (58 percent), OSHA (57 percent), the NHTSA (55 percent), and the Consumer Product Safety Commission (55 percent). Even the much-maligned EPA enjoys positive ratings from 52 percent of voters. As important, no more than one-third of voters has an unfavorable opinion of any of these agencies. These findings may stun a good number of opinion-makers, who believe that the criticism of these agencies has permeated the public conscience.[32] (See Figure 2.)

However, despite positive ratings of the enforcement agencies and the fact that two-thirds of voters believe the enforcement of laws in the US generally works well (66 percent generally works, 30 percent generally does not work) (see Figure 3), voters see room for improvement when it comes to the actual execution and application of enforcement procedures.

Moreover, a 51 percent majority believes there is too little enforcement of laws and regulations in the US compared to just 30 percent who believe there is too much enforcement.

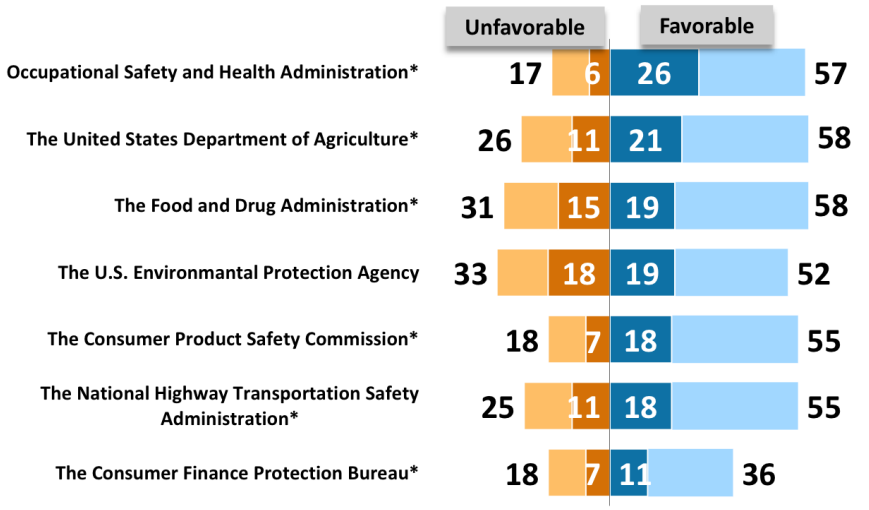
32 A plurality of voters (46 percent) lacks an opinion of the Consumer Finance Protection Bureau, though positive attitudes outweigh negative attitudes by two-to-one among those voters who have an impression (36 percent favorable, 18 percent unfavorable).

Table 1: Text of Engaged Debate Messages

OPPONENTS' MESSAGE	
(Some/Other people say) protecting consumers is important but government regulation has gone too far, so that some politicians seem to think government is the answer to every problem. Increased regulation, bureaucratic red tape, mandates, and uneven enforcement hold back economic growth and destroy jobs. America was built on the free market and free enterprise. Forcing entrepreneurs, small business owners, and citizens to submit to arbitrary government regulations puts all the power in the hands of out-of-touch bureaucrats. It raises the costs of goods and services at a time when we can't afford higher prices.	
PRO MESSAGE: FAIR, JUST APPLICATION (Some/Other people say) proper enforcement of our laws and regulations can ensure that everyone plays by the same set of rules. Today, the system is too often rigged to favor the wealthy and powerful over ordinary Americans, or big corporations over small businesses. That's an argument for better enforcement. Whether prohibiting big banks from destroying our economy, stopping the credit card industry from charging hidden fees, or preventing the wealthiest 1% from hiding billions of tax dollars in offshore tax havens – we need stronger, more just enforcement of our laws and regulations to ensure that everyone has a fair shot.	**PRO MESSAGE: PROTECTION/PREVENTION** (Some/Other people say) enforcement of our laws and regulations is about safeguarding Americans. And when done properly, enforcement can prevent economic catastrophe, protect our health, and save lives. Whether it's preventing dangerous foreign imports and food products – affected by e.Coli and salmonella poisoning – from coming to U.S. markets. Preventing dangerous pollutants from contaminating our land, air and drinking water. Or ensuring nuclear and toxic waste facilities safely contain their content. Proper enforcement of our laws helps keep Americans and our communities safer from physical and economic harm.
(80% Agree, 16% Disagree, 4% DK)	**(75% Agree, 21% Disagree, 4% DK)**

Figure 2: Ratings of Regulatory Agencies

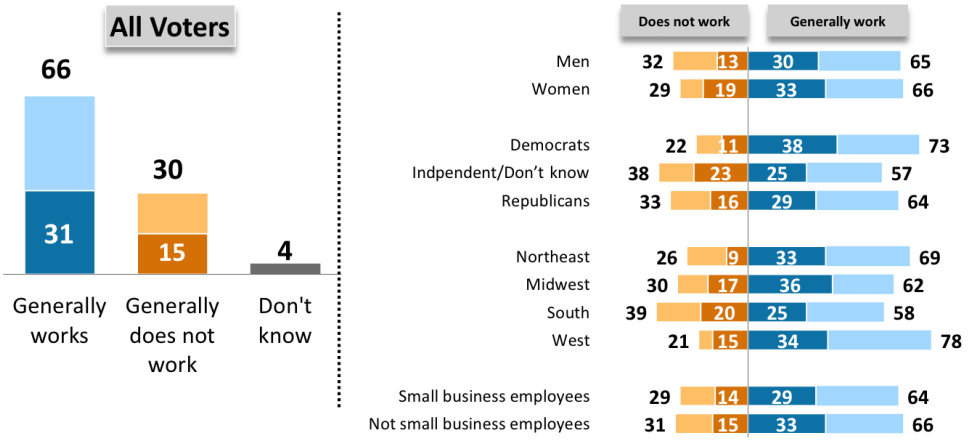
Now I'd like to ask you about some public figures or institutions. For each, please tell me whether you have a very favorable, somewhat favorable, somewhat unfavorable, or very unfavorable impression. If you haven't heard of the person, or if you don't know enough about that person to have an impression, just say so and we will move on.



Darker colors indicate intensity
*Asked to ½ of sample

Figure 3: Do Our Laws and Regulations Generally Work?

In your opinion, does the enforcement of our laws and regulations in the U.S. generally work or generally not work?*



Darker colors indicate intensity.
***Asked to ½ of sample**

Republicans are split on this question, although a plurality believe there is too little. Workers also concur that there is too little enforcement, particularly those not working in small businesses.[33] (See Figure 4.)

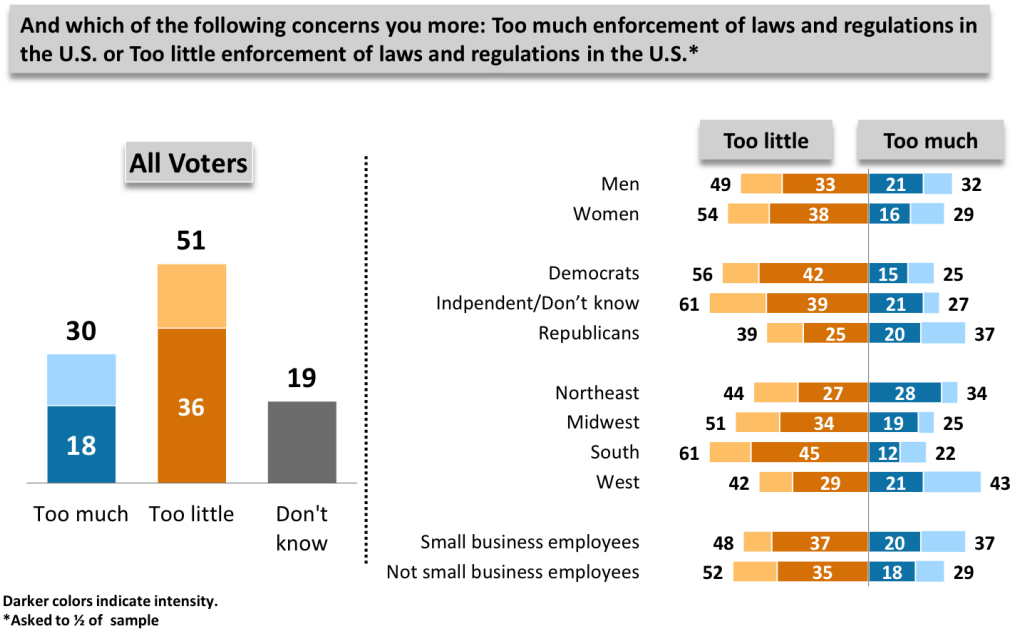
Voters believe that enforcement of laws and regulations can be most effective when it comes to "preventing deadly mistakes" (68 percent say this describes the enforcement of laws and regulations well), "protecting seniors and children" (66 percent), "reducing pollution" (59 percent), and "holding big business accountable" (51 percent).

Voters see a critical role for enforcement of laws and regulations in a number of areas of American life. Majorities believe enforcement is extremely important when it comes to "clean water" (64 percent), "food and drugs from other countries" (56 percent), and – as we have seen in previous research[34] – "government of-

33 The survey question was as follows: "Are you employed by a small business?" and respondents who answered "no" were not further broken out into employed/ not employed. However, given that 48 percent of small business employees believe there is too little enforcement (37 percent too much) and 52 percent of non-small business employees feel the same (29 percent too much), it is safe to say that "workers" or "the employed" concur there is too little enforcement.

34 Lake Research Partners designed and administered a survey conducted May 3 through May 5, 2011 by telephone using professional interviewers that reached a total of 700 likely 2012 General Election nationwide. (The margin of error for this poll is +/- 3.7 percent.) The survey found that majorities of voters would like to see greater regulation of "government officials" (55 percent) and of special interests

Figure 4: General Concerns About Our Laws and Regulations



ficials" (50 percent). Other areas where voters believe enforcement plays an important role include "civil rights," "drugs produced in the US," "nuclear energy," "Wall Street," "clean air," "work places," and "credit card companies."

These data demonstrate a substantial disconnect between the industry-backed rhetoric that denounces regulation and enforcement, and popular sentiment. Voters want the government to play a more active role in enforcing the laws to prevent and to protect against potential problems and disasters, as well as to improve accountability. They not only think enforcement provides protections, but also that it establishes fairness. Rules are designed to favor powerful special interests, but with equal enforcement, everyone (for example, small business versus big business) has a fair chance. The specific areas where voters want more enforcement are so extensive and widespread as to be nearly ubiquitous. This once again shows how much voters want broader and tougher enforcement.

Finally, this study examined the efficacy of a range of messages in support of tougher enforcement. Not surprisingly, given voters' underlying attitudes, all of the messages resonate powerfully, but the leading arguments tend to revolve around case studies, where lives and great sums of money were lost as a result of insufficient enforcement. These case studies – such as the West Virginia chemical spill – make it painfully clear that failing to enforce our laws and regulations causes costly and deadly disasters. In addition, voters prioritize messages that emphasize how lives and dollars can be saved when enforcement agencies are effective,

and lobbyists (50 percent) – with both ranking in the top tier of areas where voters want to see greater regulation.

as well as a message that calls for criminal penalties for CEOs who are found guilty of engaging in wage theft. Figure 5 and Table 2 provide information about the most convincing case studies about enforcement.

These case studies provide insight into how to discuss the need for increased enforcement. The case studies emphasize the importance of providing factually-based stories that are not overloaded with too many points. The stories also highlight the importance of having those that not only show the dangers of weak enforcement but also those that show the benefits from stronger enforcement. When money and lives are saved or problems are pre-emptively avoided, it demonstrates the value of enforcement and also shows that government is capable of doing the work, a concern for many people.

The enforcement frame tested in this research was re-tested in a survey conducted by Republican and Democratic polling firms (The Tarrance Group and Lake Research Partners in 2014), where fully half of voters surveyed said that the government should engage in fairer and tougher enforcement of government regulations. Presented with two differing perspectives on regulation and enforcement, 50 percent agreed with the statement: "We need fairer and tougher enforcement of regulations in the US to protect American workers and families and to give the little guys, including small businesses, a fair chance to compete." Just 43 percent picked the statement that read: "We need fewer burdensome government regulations because these regulations only work to make things more difficult for small businesses and individuals to create jobs and economic growth."

This finding is important. It tests the enforcement frame against the industry-led meme that regulations are burdensome and bad for the economy. Given the 40-year drumbeat in

Figure 5: Messages for Enforcement

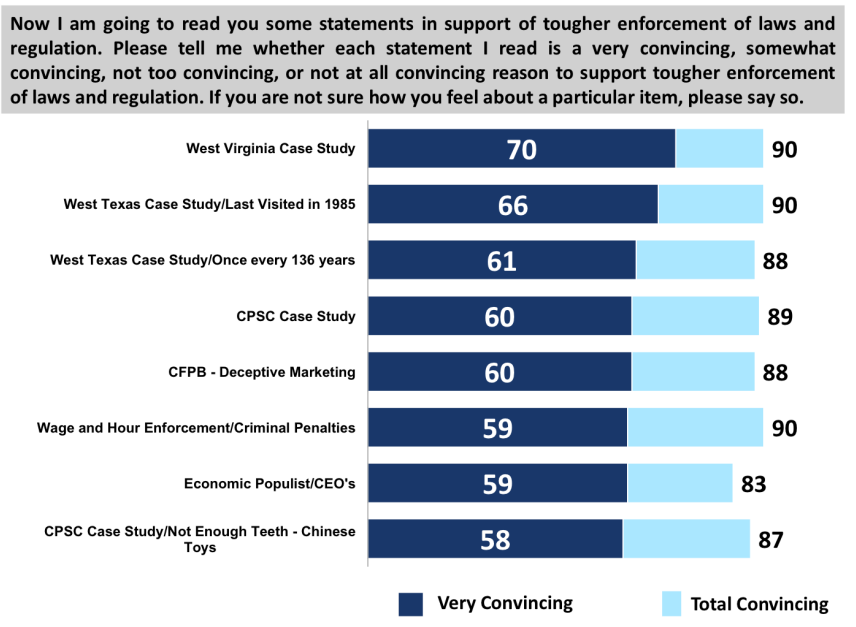


Table 2: Text of Enforcement Messages (in order of how convincing)

West Virginia Case Study Just this year, an estimated 10,000 gallons of toxic chemical waste leaked from a private storage facility into a West Virginia river due to lax enforcement. The leak contaminated the drinking water supply of over 300,000 residents, putting pregnant women, seniors, and children at risk. States are required to test public water systems regularly, but this water system hadn't been tested in over a decade, and warnings of contamination were ignored. We need proper enforcement to ensure disasters like this don't happen again.
West Texas Case Study/Last Visit '85 When enforcement of public protections is neglected, the results can be disastrous. In 2013, an explosion at a fertilizer facility in West, Texas killed 15 people, including 12 first responders, and destroyed three schools, a nursing home, and hundreds of homes. The last time that facility was inspected by OSHA was in 1985, and despite a serious violation it got just a $30 fine. We need strong and improved enforcement to prevent deadly situations like this.
West Texas Case Study/Once Every 136 Years When enforcement of public protections is neglected, the results can be disastrous. In 2013, an explosion at a fertilizer facility in West, Texas killed 15 people, including 12 first responders, and destroyed three schools, a nursing home, and hundreds of homes. With current staff, OSHA inspectors can visit workplaces like these only once every 136 years, on average. We need strong and improved enforcement to prevent deadly situations like this.
CSPC Case Study US Consumer Product Safety Commission investigators analyze data to focus their inspections on high-risk cargo. During one six-month period in 2013, the CPSC identified more than 600 shipments containing illegal or defective products from other countries, totaling about 8.2 million units, which inspectors prevented from moving into US markets and into the hands of unsuspecting consumers. When enforcement is done right, it can save Americans dollars and lives.
CFPB – Deceptive Marketing Recently, the Consumer Financial Protection Bureau ordered Bank of America to pay nearly $727 million in fines because of the bank's deceptive practices, including charging consumers for products they never agreed to. It also ordered JPMorgan Chase to pay customers $309 million, and American Express to pay customers $59.5 million for deceptive and unauthorized billing. This agency saved consumers nearly $3.5 billion in excessive fees and interest since its creation two years ago. We need to strengthen enforcement of these laws, not weaken enforcement.
Wage and Hour Enforcement/Criminal Penalties The Fair Labor Standards Act bans oppressive child labor, requires workers be paid a minimum wage, and entitles workers to overtime pay. Even so, many employers break the law, don't pay workers for their time and illegally deduct money from their paychecks. The Department of Labor collected $250 million in this kind of wage theft last year, but still lacked the resources and manpower to investigate thousands of other complaints. We need stronger enforcement, and CEOs who engage in wage theft should be held accountable with criminal penalties if found guilty.
Economic Populist/CEOs As Americans, we prize innovation, entrepreneurship, and hard work—but all of that means little when multinational corporations are allowed to operate unchecked and take advantage of us. The CEOs who wrecked our economy, wrote themselves bonuses from our bailout money and don't pay their fair share of taxes, should be held accountable and not allowed to commit the same crimes again. It's past time we started protecting regular working families. Because if CEOs continue playing by their own rules, our shrinking middle class will disappear entirely.
CSPC Case Study/Not Enough – Chinese Toys US Consumer Product Safety Commission investigators analyze data to focus their inspections on high-risk cargo. During one six-month period in 2013, the CPSC identified more than 600 shipments containing illegal or defective products from other countries, totaling about 8.2 million units and prevented them from entering our markets. But hundreds of thousands of dangerous lead-based Chinese toys still made their way into US stores and into the hands of our children. We need improved and expanded enforcement to protect America's youngest citizens.

the media of the anti-regulatory message, it is surprising that the enforcement frame wins in a head-to-head confrontation. This reinforces the potential of the enforcement frame as a means for sidestepping the tired debate about more or less regulation.

V. CONCLUSIONS

The chemical spill in West Virginia and attempts to dilute Wall Street reforms are examples of an ongoing problem that the public rarely sees: a rulemaking system dominated by powerful special interests. When rules and enforcement are weak, the public's health and safety suffer.

Daily news stories show a common pattern: The mine explosion that kills workers; the salmonella-tainted peanut butter that sickens hundreds of people; the explosion of a fertilizer facility that kills first responders and destroys surrounding buildings such as schools and homes; imports that endanger the health of our children and pets; deceptive marketing practices; the ignition switch defect in cars that kills and injures people; and more. However, these examples are not seen by our elected leaders as part of a pattern pointing to a need for policy reform. According to the survey data presented in this article, the public sees the pattern.

If voters are frustrated about regulations, it is because they want better enforcement. They want fairer, more equal, and tougher action by government agencies. This is true regardless of political party – there is no statistically meaningful difference between Republicans, Democrats, and Independents on these issues.

More attention and more resources need to be focused on improving enforcement. Instead of cutting funding for federal agencies charged with enforcement, funding and resources should be increased. Instead of limiting agency authority to enforce, such laws should be expanded to protect the public. Instead of permitting corporate executives to walk away from the harm they cause, criminal and stronger civil penalties should be imposed. Penalties levied against corporate violators should be large enough to serve as a meaningful deterrent from future violations. If the public – on a bipartisan basis – can agree to these steps, our elected leaders should also find common ground.

This article started with a description of research that demonstrates the public benefits and value of regulations. Unfortunately, the promise of further regulatory protections has been undermined by a long-term campaign led by industry and conservatives that has vilified regulation. Through various forms of regulatory capture and legislative and executive reforms, industry has delayed rulemaking, tilted regulatory outcomes in favor of industry, and underfunded agencies. The net result has been a weakened regulatory system characterized by toothless enforcement.

The survey data presented in this article demonstrate nearly unanimous support among voters for increased enforcement of laws and regulations. A majority of voters is concerned that there is too little – not too much – enforcement of current laws and regulations. While these voter sentiments may not translate into immediate policy change, they provide a good foundation for new, public interest-oriented reforms.

VI. REFERENCES

Abramoff, J. Nov 18, 2011. "Willing Vassals" in Congress Do Lobbyist Bidding, *Bloomberg Business.* Retrieved from http://www.bloomberg.com/news/articles/2011-11-18/-willing-vassals-in-congress-do-lobbyist-bidding-jack-abramoff.

Abramoff, J. 2011. *Capitol Punishment: The Hard Truth About Washington Corruption From America's Most Notorious Lobbyist*, WND Books.

Ackerman, F. and Heinzerling, L. 2004. *Priceless: On Knowing the Price of Everything and the Value of Nothing,* The New Press: New York.

AFL-CIO Safety and Health Department. May 2014. Death on the Job: The Toll of Neglect, 23rd Edition. Retrieved from http://www.aflcio.org/content/download/126621/3464561/DOTJ2014.pdf.

Ashford, N. A., Ayers, C., & Stone, R. F. 1985. Using Regulation to Change the Market for Innovation, *Harvard Environmental Law Review*, Vol 9 (No. 2), 419-466. Retrieved from https://dspace.mit.edu/bitstream/handle/1721.1/1555/%252319.PDF?sequence=1.

Ashford N. A. & Hall, R. P. 2011. *Technology, Globalization and Sustainable Development: Transforming the Industrial State*, New Haven: Yale University Press. P. 412-415.

Atkin, E. Jan 12, 2015. New Analysis Shows West Virginia's Chemical Spill Traveled Into Kentucky, *Climate-Progress*. Retrieved from http://thinkprogress.org/climate/2015/01/12/3610693/chemical-spill-not-just-west-virginia/.

Behr, P. Aug 13, 1981. U.S. Memo on Air Bags in Dispute. *Washington Post*. Retrieved (for fee) from: http://pqasb.pqarchiver.com/washingtonpost_historical/doc/147350954.html?FMT=ABS&FMTS=ABS:AI&type=historic&date=Aug+13%2C+1981&author=By+-Peter+Behr+Washington+Post+Staff+Writer&-desc=U.S.+Memo+On+Air+Bags+In+Dispute,

Bennett, J. July 21, 2014. Four Years After Passage, House Keeps Trying to Kill Dodd-Frank, *Center for Public Integrity*. Retrieved from http://www.publicintegrity.org/2014/07/21/15124/four-years-after-passage-house-keeps-trying-kill-dodd-frank.

Bernstein, J. September 26, 2014. Inside the New York Fed: Secret Recordings and a Culture Clash, *ProPublica*. Retrieved from http://www.propublica.org/article/carmen-segarras-secret-recordings-from-inside-new-york-fed.

Bernstein, L. January 10, 2014. Chemical Spill into W.Va. River Spurs Closures, Run on Bottled Water, *The Washington Post*. Retrieved from http://www.washingtonpost.com/national/health-science/chemical-spill-into-wva-river-spurs-closures-run-on-bottled-water/2014/01/10/a6ec518a-7a0e-11e3-b1c5-739e63e9c9a7_story.html.

Berzon, A, & Maher, K. January 13, 2014. West Virginia Chemical-Spill Site Avoided Broad Regulatory Scrutiny, *Wall Street Journal*. Retrieved from http://www.wsj.com/articles/SB10001424052702303819704579317062273564766.

Carpenter, D. & Moss, D. A. 2014. Introduction. In Daniel Carpenter and David A. Moss (Eds.), *Preventing Regulatory Capture: Special Interest Influence and How to Limit It*, (pp. x-x). Cambridge University Press.

Carrigan, C. 2014. Captured by Disaster? Reinterpreting Regulatory Behavior in the Shadow of the Gulf Oil Spill. In Daniel Carpenter and David A. Moss (Eds.), *Preventing Regulatory Capture: Special Interest Influence and How to Limit It*, (pp. 239-291). Cambridge University Press.

Centers for Disease Control. October 15, 1999. Achievements in Public Health, 1900-1999: Safer and Healthier Foods, *MMWR Weekly*, 48(40);905-913. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4840a1.htm.

Charles, D. January 21, 2015. Clean Up Those Contaminated Chicken Parts, USDA Tells Industry, *NPR*. Retrieved from http://www.npr.org/blogs/thesalt/2015/01/21/378844287/clean-up-those-contaminated-chicken-parts-usda-tells-industry.

Cohen, A. & Taylor, L. May 18, 2010. Eleven to One: Pro-Reform Derivatives Lobbyists Vastly Outnumbered by Opposition, Public Citizen. Retrieved from http://www.citizen.org/documents/DerivativesLobbyistsReport.pdf.

Cohen, P. February 3, 2015. When Company Is Fined, Taxpayers Often Share Bill, T*he New York Times*. Retrieved from http://www.nytimes.com/2015/02/04/business/when-a-company-is-fined-taxpayers-often-share-the-punishment.html?rref=us&_r=2.

Copeland, C. W. April 2011. Analysis of an Estimate of the Total Costs of Federal Regulations, Congressional Research Service. Retrieved from http://www.progressivereform.org/articles/CRS_Crain_and_Crain.pdf.

Crain, W. M. & Crain, N. V. September 2010. The Impact of Regulatory Costs on Small Firms, Washington, DC: Office of Advocacy, U.S. Small Business Administration. Retrieved from https://www.sba.gov/sites/default/files/advocacy/The%20Impact%20of%20Regulatory%20Costs%20on%20Small%20Firms%20%28Full%29_0.pdf.

Crain, W. M. & Crain, N. V. September 2014. The Cost of Federal Regulation to the U.S. Economy, Manufacturing and Small Business, National Association of Manufacturers. Retrieved from http://www.nam.org/Data-and-Reports/Cost-of-Federal-Regulations/Federal-Regulation-Full-Study.pdf.

Crane, R. February 1, 2004. The Myths and Realities of Financial Effects of Clean Indoor Air Legislation, Dept of Family Medicine, The Ohio State University. Retrieved from http://www.quittingsmokingtimeline.com/info/faqs/nfaqs/pdf/category/878267545327/Economics_White_Paper.pdf.

Crowther, A. February 14, 2013. Regulation Issue: Industry's Complaints About New Rules Are Predictable – and Wrong, Public Citizen. Retrieved from http://www.citizen.org/documents/regulation-issue-industry-complaints-report.pdf.

Dodd, C. July 22, 2012. Why Dodd-Frank is Necessary, *Politico*. Retrieved from http://www.politico.com/news/stories/0712/78819.html.

Drutman, L. 2015. *The Business of America is Lobbying: How Corporations Became Politicized and Politics Became More Corporate*, New York:Oxford University Press.

Executive Order 12291. 1981. Federal Regulation, 46 FR 13193, 3 CFR, 1981 Comp., p. 127, unless otherwise noted. Retrieved from http://www.archives.gov/federal-register/codification/executive-order/12291.html.

Finkle, V. March 4, 2015. Could the Fight Over Cost-Benefit Analysis Kill Reg Relief? *American Banker*. Retrieved from http://www.americanbanker.com/law-regulation/.

Friedman, J (Ed.). 2011. *What Caused the Financial Crisis*, University of Pennsylvania Press.

Garrett, B. 2014. *Too Big to Jail*, Belknap Press.

Goolsbee, A. June 2011. A 21st Century Regulatory System, White House website. Retrieved from https://www.whitehouse.gov/blog/2011/06/23/21st-century-regulatory-system.

Hansen, E., Betcher, M., Stroud, A. & Rosser, A. February 5, 2015. Impacts of HB 2574 and SB 423 on the number of tanks regulated by the Aboveground Storage Tank Act. Retrieved from http://www.downstreamstrategies.com/documents/reports_publication/asts-in-wv-a-snapshot.pdf.

Hensarling, J. July 16, 2014. Hensarling: Dodd-Frank Results in Less Freedom, Less Opportunity and a Less Dynamic Economy, *Press Release*. Retrieved from http://financialservices.house.gov/news/documentsingle.aspx?DocumentID=388236.

Hodges, H. 1997. Falling Prices: Cost of Complying With Environmental Regulations Almost Always Less Than Advertised, Economic Policy Institute. Retrieved from http://www.epi.org/publication/bp69.

Irons, J. & Green, A. July 2011. Flaws Call For Rejecting Crain and Crain Model, Economic Policy Institute. Retrieved from http://s1.epi.org/files/page/-/EPI_IssueBrief308.pdf.

Johnson, S. M. 2006. Junking the "Junk Science" Law: Reforming the Information Quality Act. *Administrative Law Review*, 58:1, 37-83.

Kerwin, C.M., 2003. *Rulemaking: How Government Agencies Write Law and Make Policy*, 3rd Edition, CQ Press.

Kim, S. M. December 10, 2014. Elizabeth Warren to Dems: Kill the Bill, *Politico*. Retrieved from http://www.politico.com/story/2014/12/elizabeth-warren-budget-bill-opposition-113470.html.

Kindy, K. March 17, 2014. Congress Members Protest USDA's Proposed Poultry Inspection System, *The Washington Post*. Retrieved from http://www.washingtonpost.com/blogs/federal-eye/wp/2014/03/17/congress-members-protest-usdas-proposed-poultry-inspection-system/.

Kuttner, R. 2008. *The Squandering of America: how the failure of our politics undermines our prosperity*: Vintage.

Lardner, James. 2011. Good Rules: 10 Stories of Successful Regulation, Demos. Available at: http://www.demos.org/sites/default/files/publications/goodrules_1_11.pdf.

Lubbers, J. S. 2012. *A Guide to Federal Agency Rulemaking (5th edition)*. American Bar Association: IL.

Maher, K. February 23, 2015. Storage-Tank Safety Revisited, *The Wall Street Journal*, p. A3.

McGarity, T. O. 1992. Some Thoughts on "Deossifying" the Rulemaking Process, *Duke Law Journal*, vol. 41,1385-1462. Retrieved from http://scholarship.law.duke.edu/dlj/vol41/iss6/2.

McGarity, T. O. Autumn, 1996. The Expanded Debate Over the Future of the Regulatory State, *University of Chicago Law Review*, Vol. 63, No. 4, pp. 1463-1532

McGarity, T. O. 2013. *Freedom to Harm: The Lasting Legacy of the Laissez Faire Revival*, Yale University.

Morgenson, G. January 10, 2015. Kicking Dodd-Frank in the Teeth, *The New York Times*. Retrieved from http://www.nytimes.com/2015/01/11/business/kicking-dodd-frank-in-the-teeth.html?_r=0.

Mouzoon, N. & Lincoln, T. September 2011. Regulation: The Unsung Hero in American Innovation, Public Citizen. Retrieved from http://www.citizen.org/documents/regulation-innovation.pdf.

National Council on Disability. 2007. The Impact of the Americans with Disabilities Act: Assessing the Progress Toward Achieving the Goals of the ADA. Retrieved from http://www.ncd.gov/rawmedia_repository/f493e262_8a9e_49c8_ad84_404a1b91d7c3?document.pdf.

National Highway Traffic Safety Administration. May 2012. Traffic Safety Facts: Occupant Protection. Retrieved from http://www-nrd.nhtsa.dot.gov/Pubs/811619.pdf.

Obama, B. July 21, 2010. Remarks by the President at Signing of Dodd-Frank Wall Street Reform and Consumer Protection Act. Retrieved from http://www.whitehouse.gov/the-press-office/remarks-president-signing-dodd-frank-wall-street-reform-and-consumer-protection-act.

Office of Management and Budget. 2014. 2014 Draft Report to Congress on the Benefits and Costs of Federal Regulations and Unfunded Mandates on State, Local, and Tribal Entities. Retrieved from https://www.whitehouse.gov/sites/default/files/omb/inforeg/2014_cb/draft_2014_cost_benefit_report-updated.pdf.

Osnos, E. April 7, 2014. Chemical Valley, *The New Yorker*. Retrieved from http://www.newyorker.com/magazine/2014/04/07/chemical-valley.

Pew Environment Group. October 2010. Industry Opposition to Government Regulation. Retrieved from http://www.pewtrusts.org/~/media/Assets/2011/03/Industry-Clean-Energy-Factsheet.pdf.

Posner, R. A. 2014. The Concept of Regulatory Capture: A Short, Inglorious History. In Daniel Carpenter and David A. Moss (Eds.), *Preventing Regulatory Capture: Special Interest Influence and How to Limit It*, (pp. 49-x). Cambridge University Press.

Powell, L. August 23, 1971. Attack on the Free Enterprise System. Retrieved from http://law2.wlu.edu/deptimages/Powell%20Archives/PowellMemorandumTypescript.pdf.

Public Citizen. November 19, 2009. Cashing In: More Than 900 Ex-Government Officials, Including 70 Former Members of Congress, Have Lobbied for the Financial Services Sector in 2009. Retrieved from http://www.citizen.org/documents/Ca$hing_in.pdf.

Rivlin, G. April 30, 2013. How Wall Street Defanged Dodd-Frank, *The Nation*. Retrieved from http://www.thenation.com/article/174113/how-wall-street-defanged-dodd-frank#.

RT.com. January 15, 2014. Single Cinder Block Was Used to Contain Toxic Chemical Prior to Mass W. Virginia Spill. Retrieved from http://rt.com/usa/west-virginia-chemical-emergency-606/.

Savage, C. Sept 10, 2008. Sex, Drug Use and Graft Cited in Interior Department, *New York Times*. Retrieved from http://www.nytimes.com/2008/09/11/washington/11royalty.html?pagewanted=all&_r=0.

Schwellenbach, N. August 2013. What's at Stake: Austerity Budgets Threaten Workers Health and Safety, Center for Effective Government. Retrieved from http://www.foreffectivegov.org/whatsatstake-workersafety.

Schroeder, P. & Cirilli, K. December 10, 2014. Warren, Left Fume Over Deal, *The Hill*. Retrieved from http://thehill.com/regulation/finance/226638-democrats-balking-at-dodd-frank-changes-in-cromnibus.

Seidenfeld, M. 2000. A Table of Requirements for Federal Administrative Rulemaking, *Florida State University Law Review,* Vol. 27, 533-545. Retrieved from http://archive.law.fsu.edu/Journals/laWrevieW/downloads/272/Seid.pdf.

Shapiro, I. & Irons, J. April 12, 2011. Regulation, Employment, and the Economy: Fears of job loss are overblown, Economic Policy Institute. Retrieved from http://www.epi.org/files/2011/BriefingPaper305.pdf.

Small Business Administration. 2010. The Impact of Regulatory Costs on Small Firms, Washington, DC: Office of Advocacy. Retrieved from https://www.sba.gov/advocacy/impact-regulatory-costs-small-firms.

Smallberg, M. February 2013. Dangerous Liaisons: Revolving Door at SEC Creates Risk of Regulatory Capture, Project on Government Oversight. Retrieved from http://www.pogo.org/our-work/reports/sec-revolving-door.html.

Steinzor, R. 2014. *Why Not Jail? Industrial Catastrophes, Corporate Malfeasance, and Government Action*, Cambridge University Press.

Steinzor, R., & Shapiro, S. 2010. *The People's Agents and the Battle to Protect the American Public: Special Interests, Government, and Threats to Health, Safety, and the Environment*. University of Chicago Press.

Stiglitz, J. E. 2010. *Freefall: America, free markets, and the sinking of the world economy*: WW Norton & Co Inc.

Sugden, J. January 14, 2015. Wall Street's Investments in Deregulation, *Center for Responsive Politics*. Retrieved from http://www.opensecrets.org/news/2015/01/wall-streets-investments-in-deregulation/.

The Economist. September 7, 2013. The Origins of the Financial Crisis: Crash Course. Retrieved from http://www.economist.com/news/schools-brief/21584534-effects-financial-crisis-are-still-being-felt-five-years-article.

The Tarrance Group and Lake Research Partners. December 18, 2014. The Battleground Poll, Global Media Institute at George Washington University. Retrieved from https://mediarelations.gwu.edu/battleground-poll.

Troy, D. E. 2003. Drug Price Competition and Patent Term Restoration Act of 1984 (Hatch-Waxman Amendments). Statement before the Senate Committee on the Judiciary. Retrieved from http://www.fda.gov/newsevents/testimony/ucm115033.htm

U.S. Chemical Safety Board. July 16, 2014. CSB Investigation Finds No Record of Inspections on Freedom Industries Chemical Storage Tanks; Leak in Bottom of Tank that Contaminated Charleston, WV, Drinking Water Resulted from Corrosion Caused by Water Seeping through Holes in Tank Roof. Retrieved from http://www.csb.gov/csb-investigation-finds-no-record-of-inspections-on-freedom-industries-chemical-storage-tanks-leak-in-bottom-of-tank-that-contaminated-charleston-wv-drinking-water-resulted-from-corrosion-caused-by-water-seeping-through-holes-in-tank-roof-/.

U.S. Environment Protection Agency. 2000. America's Children and the Environment: A First View of Available Measures. Retrieved from http://www2.epa.gov/sites/production/files/2014-05/documents/ace-report.pdf.

U.S. Environmental Protection Agency, Office of Air and Radiation. April 2011. The Benefits and Costs of the Clean Air and Radiation Act from 1990 to 2020. Retrieved from http://www.epa.gov/cleanairactbenefits/feb11/fullreport_rev_a.pdf.

Ward, K., Jr. January 10, 2014. What is "'Crude MCHM"? Few know, *The Charleston Gazette*. Retrieved from http://www.wvgazette.com/News/201401100078.

Ward, K., Jr. January 13, 2014. DEP inspectors describe early scene at Freedom leak site, *The Charleston Gazette*. Retrieved from http://www.wvgazette.com/News/201401130118.

Ward, K., Jr. January 8, 2015. A Year Later: Chemical Spills Continue, and So Do Questions, *West Virginia Gazette*. Retrieved from http://www.wvgazette.com/article/20150108/GZ01/150109388/1419.

Warren, E. October 3, 2014. Primer for the Goldman Sachs Secret Tapes, *The Boston Globe*. Retrieved from http://www.bostonglobe.com/opinion/2014/10/03/elizabeth-warren-recommended-reading-for-goldman-sachs-secret-audio-tapes/DeSAYlnKEnxEhWLYpmcC9J/story.html.

Weatherford, K. October 2013. Securing the Right to a Safe and Healthy Workplace, *Center for Effective Government*. Retrieved from http://www.foreffectivegov.org/right-to-safe-workplace.

Weatherford, K. December 9, 2014. UPDATE: Freedom Industries President Faces Criminal Charges for West Virginia Chemical Leak, *Center for Effective Government*. Retrieved from http://www.foreffectivegov.org/almost-heaven-west-virginia-contamination-highlights-long-standing-problems-chemical-oversight.

Weeks, J. L., & Fox, M. 1983. Fatality rates and regulatory policies in bituminous coal mining, United States, 1959-1981. *American Journal of Public Health*, 73 (11), 1278.

Zarroli, J. March 24, 2015. Not Prosecuting Companies If They Promise To Behave, *NPR*. Retrieved from http://www.npr.org/2015/03/24/394897368/not-prosecuting-companies-if-they-promise-to-behave.

Federal Rulemaking and the US Food and Drug Administration: International Regulatory Policy Cooperation in the 21st Century

Reba A. Carruth

The globalization of food and biopharmaceutical drug industries and product supply chains increases the risks for public health and consumer protection in the United States. The weak or absent science-based food and drug regulatory policies, inspection, and surveillance systems in many countries that import goods to the US increases the need for FDA action. The FDA is rapidly working to strengthen food and drug safety regulation in the US, and "beyond the borders" through international regulatory policy cooperation. Overtime, the FDA is building global regulatory networks and coalitions of regulatory authorities to strengthen national and regional capacity for science-based systems of prevention, detection, and management of food and drug safety risks. The impacts and implications of globalization for domestic food and drug safety regulation are being addressed through the rulemaking process. To achieve its mission, the FDA must work to strengthen understanding, awareness, and support of international regulatory policy cooperation by the federal government, states, territories, tribal authorities, and the public.

I. INTRODUCTION

In the United States, international regulatory policy cooperation is an important and growing area of public policy, public management, governance and regulation (ACUS 1991).[1] One prominent example of this is the mitigation of carbon dioxide emissions which requires cooperation among countries to address global environmental effects that negatively impact the protection of clean air and water in the United States (McCarthy 2011). However, the growth in international influence and standards harmonization threatens the capacity of executive agencies to achieve their missions and goals. In the federal government, the executive branch and independent agencies historically develop national regulatory policy and rules based on domestic considerations. State governments traditionally base policy mandates and general regulatory agendas on local issues. In the early 20th century, national regulatory agencies

1 International regulatory policy cooperation is required for US federal agencies to achieve their missions in the United States.

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began to use science and technology innovations, public administration, management, and industry expertise to strengthen policy implementation, rulemaking, and goal attainment.

By the end of the century, increasing globalization of markets and the expansion of free trade and industries exceeded the national regulatory capacity and jurisdiction of federal government regulatory agencies such as the US Food and Drug Administration (FDA), US Department of Agriculture (USDA), and the Environmental Protection Agency (EPA). The FDA is one of the oldest public health, scientific, regulatory, and consumer protection agencies in the United States federal government (FDA "History"). In this role, the FDA is responsible for food products (except meat and poultry which are controlled by the USDA), human and veterinary drugs, biological agents, medical devices, and radiation emitting devices (FDA "History"). In order to understand the impacts of these new pressures, statutory requirements and obligations of the FDA require democratic oversight by citizens, states, and federal government authorities. This, however, is itself challenged by the growth in complexity and the narrow range of actors involved in providing evidence in support of science-based rulemaking.

In 2009, the FDA reported that regulated food, drug, and medical device products were produced in over 150 countries. The food and drug products were manufactured in over 300,000 plants and factories outside of the United States (FDA "Global Initiative"). The FDA currently estimates that millions of food products enter the US food system every year, with approximately 15 percent of the US food supply originating outside of the country. Consequently, the FDA requires international regulatory policy cooperation to accomplish the agency mission and to protect food, drug, and medical device safety (FDA 2011).

In the 21st century, international regulatory policy cooperation is now required for national regulation of the following strategic sectors: food safety, biopharmaceutical drug safety, climate change mitigation of carbon emissions, renewable and efficient energy, consumer protection, product safety, transportation, automotive fuel standards, consumer protection, public health, free trade, public safety, industry standards, and national security (GAO 2013). Global threats, unregulated free trade, and lack of global industry regulation increase risks to American consumers, society, and the nation. Therefore, national regulation of food safety and drug safety by the FDA requires international regulatory policy cooperation to protect citizens, consumers, public health, and the public good of the United States (FDA 2012).

This article examines the implications of globalization on federal rulemaking in the US Food and Drug Administration (FDA). In the context of globalization and FDA rulemaking for food and drug safety, the following public laws are examined:

1. Food Safety – FDA Food Modernization Act ("The FDA Act"): Public Law 111-353, 124 STAT. 3885, [H.R. 2751]. This Act amends the Federal Food, Drug, and Cosmetic Act. The FDA regulatory policy reform modernizes the human food and animal feed system. In this process, the FDA creates a science-based preventative regulatory framework for the protection of the entire national food system and

supply chain. The FDA Act regulates domestic and foreign firms and industries that supply human food and animal feed from "farm to table."

2. Drug Safety – Food and Drug Administration Safety and Innovation Act: Public Law 112-144, 112nd Congress, 126 STAT. 993, [S. 3187].[2] This regulatory reform is intended to strengthen the agency's capacity to protect the integrity of the national drug supply chain in the context of biopharmaceutical industry globalization. The regulations enforce compliance with mandatory standards for imported drugs, importing companies, and manufacturers to the US.

International regulatory policy cooperation for food safety and drug safety is examined relative to the following federal rulemaking issues:

- The impacts of food and drug industry globalization and free trade on FDA national regulatory capacity.

- The jurisdiction, product standards, compliance and enforcement, factory inspections, role of the states, and accountability.

- Opportunities to strengthen international regulatory policy cooperation and integration, such as the roles of NAFTA, TTIP, and UN global science-based standard harmonization bodies – the UN World Health Organization (WHO) and the World Organization for Animal Health.

II. BACKGROUND

The US Congress has legal authority to make laws in and for the United Sates. The growing scale and scope of shared public health, product safety, and public goods management challenges – such as infectious diseases, clean air, and water – has led to a focus on science-based regulation by federal regulatory agencies (Vogel and Kagan 2004, US-EU 2009). Globalization of regulation is used by independent regulatory agencies and national governments to protect society and the collective good of nations (Drahos and Braithwaite 2001). This follows a trend at the international level for empirical evidence-based analysis, using techniques such as cost-benefit analysis. Overtime, national rulemaking processes have become increasingly influenced by globalization (Strauss 2006). In turn, federal rulemaking and regulatory agency mission achievement is challenged by shared threats to public health, food and drug product safety, climate change, and environmental pollution. Local accountability and transparency requirements are also impacted as the scope of threats amplifies the need for multi-level regulation (Levi-Faur 2011).

The growing need for FDA cooperation with foreign counterpart agencies, international standards bodies, and multilateral institutions such as the World Health Organization, gives rise to multi-level regulation and governance. FDA international regulatory cooperation increasingly involves regional and global agency networks for food and drug safety regulation and standards harmonization (Peel 2010). International regulatory cooperation introduces

2 The Food and Drug Safety and Innovation Act (FDASIA). http://www.gpo.gov/fdsys/pkg/PLAW-112publ144/pdf/PLAW-112publ144.pdf; https://www.federalregister.gov/articles/2013/06/19/2013-14549/food-and-drug-administration-safety-and-innovation-act-title-vii-drug-supply-chain-standards-for

multi-level regulation that encompasses local, state, federal, regional, and global systems of science-based regulation of food and drug safety. International regulatory cooperation presents challenges and opportunities for innovation in federal rulemaking to achieve the missions and goals of domestic regulatory agencies.

III. GLOBALIZATION, FDA NATIONAL FOOD AND DRUG SAFETY REGULATION, AND MISSION ACHIEVEMENT

In the domestic policy process, executive and independent agencies develop regulations for the protection of citizens, consumers, society, states, and the collective good of the nation. Rulemaking procedures require that state legislatures provide broad public policy and public management framework and mandates. Based on guidelines provided by the states, the federal government, and independent regulatory bodies develop the detailed implementation strategy to achieve national policy goals and objectives.

In the United States, food and drug safety are among the most important and strategic regulatory goals. Since colonial times, America has faced food and drug safety threats from unregulated and imported agricultural and medicine products (FDA "Overviews of FDA History"). The government created customs laboratories in response to American industrialization and public health risks from imported food and drugs. The customs laboratories introduced scientific methods and regulatory practices to prevent unsafe and poor quality drugs and medicine imports from Europe and other foreign countries. By the early 20th century, US federal government agencies adopted science cooperation, technology innovation, and public management standards to achieve their statutory missions and policy goals.

FDA AGENCY MISSION, REGULATION, AND GLOBALIZATION

The FDA is an independent federal regulatory agency that sits within the US Department of Health and Human Services. Through inter-agency collaboration in the areas of public health, chemistry, agriculture, and social services, the FDA was created as a science-based regulatory body in 1906. The FDA is responsible for US food and drug industry regulation, and for security of the national food and biopharmaceutical drug supply. The FDA regulates all food, feed, and biopharmaceutical drug ingredients and their manufacture.

As an independent regulatory agency, the FDA historically relied on the Food and Drug Act of 1906 to protect food and drug safety in the United States (FDA "Federal Food and Drugs Act of 1906"). By the 1990s, globalization of US food and biopharmaceutical drug industry manufacturing, product sourcing, and trade exceeded the national regulatory capacity of the FDA. It became clear that the FDA could no longer protect food and drug safety as a domestic-focused agency that operated primarily within US borders and jurisdictions. Instead, international regulatory policy cooperation by the FDA was required to achieve its statutory mission.

In response to these external threats, the FDA reorganized food and drug safety regulatory operations. In this process, the FDA increasingly builds regulatory oversight of food and drug imports at their source of origin around the world through international regulatory

policy cooperation (FDA 2011, FDA "Global Initiative"). The FDA implemented a Beyond Our Borders initiative to globalize regulatory operations and inspection strategies to protect food and drug safety in the United States (FDA 2008). Despite this internal strengthening, the FDA continues to face growing threats and challenges. Empirical approaches have been adopted as a way to measure risks and evaluate interventions. The FDA's strategic plan for 2011-2018 explicitly states the need for stronger regulatory science, science-based regulation, and risk management (FDA 2014).

The following FDA mission requires science-based regulation, risk management, and international policy cooperation to protect public health, consumer protection, and food, drug and medical device safety:

FDA is responsible for protecting the public health by assuring the safety, efficacy, and security of food, human and veterinary drugs, biological products and medical devices…FDA is also responsible for advancing the public health by helping to speed innovations that make medicines and foods more effective, safer, and more affordable; and helping the public get the accurate, science-based information they need to use food, human and veterinary drugs, biological products and medical devices (Institute of Medicine 2006).

GLOBALIZATION IMPACTS OF FDA FOOD AND DRUG SAFETY REGULATION

The FDA once relied on food and drug factory and port inspections to protect public health, consumers, and product safety. The globalization of national food and biopharmaceutical drug supply chains has increased food and drug import risks (FDA 2011, FDA "Food and Drug Administration Safety and Innovation Act"). The source of the growing risks to US public health and consumers is due to the inability to regulate global food and drug supply chains across several countries and regions. As a result, counterfeit, substandard, contaminated, and intentionally adulterated food and drug products can enter the US market (FDA 2011). Technological innovations by food and drug firms have accelerated global industry consolidation and cross-border free trade. The outsourcing of US manufacturing, sub-contracting of food and drug production, and their re-importation increase the risks to American public health and product safety. An indicator of the need for stronger regulatory measures to achieve the agency's national mission and responsibilities is the share of products that are imported. The FDA reported that 80 percent of all active biopharmaceutical drug and medicine ingredients, 80 percent of all seafood, 40 percent of all finished dosage drugs, and approximately 50 percent of all fresh fruit are produced outside the United States (FDA 2011, FDA "Global Initiative").

As market globalization and free trade accelerate, the growing scope of national regulation is a source of conflict within state and local governments as authority and autonomy are eroded. At the same time, the growing impact of globalization on FDA food and drug safety regulation is now a source of public concern over growing threats to public health and consumer protection. Public concerns are exacerbated by the lack of transparency and local accountability in the FDA regulatory process (Wallach 2009).

GLOBALIZATION, INTERNATIONAL REGULATORY POLICY COOPERATION, AND THE FDA

In response to food and drug industry and trade globalization, the FDA is building international regulatory policy cooperation to achieve its statutory mission. The FDA has launched a globalization of regulatory agency strategy that is proactive and focuses on the prevention, detection, and rapid removal of food and drug safety threats from imported products (FDA "Global Initiative"). Earlier FDA efforts for international regulatory cooperation were limited. In response to the growing challenges of globalization on national regulation, in 1991, the Administrative Conference of the United States (ACUS) – an independent federal agency in the Executive Branch of the federal government – adopted Recommendation 91-1: Federal Agency Cooperation with Foreign Government Regulators.[3] To establish stronger cooperation between US regulatory agencies and their counterparts in foreign countries (primarily through identifying foreign bodies that have the same mission as the agency), US regulatory agencies were advised to develop harmonized regulations for common regulatory tasks such as the protection of public health, facility and plant inspections, consumer protection, food safety, drug safety, and environmental protection. This recommendation also advised the domestic agency to determine the reliability of other international agencies and to understand their technical, regulatory, and administrative standards (Aman 2001).

The goal of international regulatory policy cooperation by US government policy and federal regulatory agencies such as the FDA is as follows:

- To share human and financial resources to address common and shared regulatory problems and threats,
- To cooperate on shared regulatory compliance practices, i.e. food and drug inspections, factory visits, etc, and
- To strengthen domestic and international regulatory capacity through the improvement of regulatory practice, research and development, capacity building, and standards harmonization (ACUS 1991, Timmermans and Epstein 2010).

The ACUS also advised US agencies to engage in international regulatory cooperation to strengthen mutual recognition tests, certifications, inspection, and information gathering. The US regulatory agencies were also encouraged to work with existing bilateral/multilateral/international organizations and standards bodies to address common regulatory problems and challenges (Wessel and Wouters 2008). This has entailed the participation of US government and private industry interests (Black 2008, Wessel and Wouters 2008).

3 The Administrative Conference of the United States reports to the White House, and is responsible for providing recommendations for the improvement of administrative process through consensus driven research, non-partisan expert advice and recommendations for improvement of federal agency, public policy and regulatory policy processes.

IV. CHALLENGES FOR FDA REGULATION OF US FOOD AND DRUG SAFETY

The growing risk of naturally occurring infectious diseases, intentional adulteration, and bioterror against the US food and drug systems is now a shared threat for the FDA and other regulatory agencies such as the USDA, EPA, and Department of Defense. However, factory inspections – the dominant verification and enforcement tool of the FDA – frequently reveal non-compliance with FDA regulations for food and drug safety. In 2008, the Centers for Disease Control raised concerns and warnings about the growing incidence of allergic reactions by patients on dialysis to the blood thinner Heparin. In response, the FDA and the public expressed concerns over the growing risks from the outsourcing of biopharmaceutical drug manufacturing (Pew 2012). By 2012, the FDA announced patient injuries and deaths in the United States due to adulterated Heparin from China (Pew 2012). In 2014, factory inspections for antibiotic drugs manufactured in India for the US market revealed products that had no active ingredient (Harris 2014). In 2005, an FDA investigative operation found that 85 percent of drugs labeled as produced in Canada were in fact produced in over 25 different countries (FDA 2005). In response, the FDA seeks to protect public health and consumer safety through prescription drug import warnings (FDA "Buying Medicines Over the Internet"). Each of these examples demonstrates the need to strengthen surveillance and monitoring within those countries that export food and drugs to the United States. A preventative global approach by the FDA is emerging, which strengthens drug safety through FDA foreign plant inspections and the enforcement of US regulations.

GLOBALIZATION CHALLENGES FOR REGULATION OF FOOD SAFETY

The FDA estimates that approximately 15 percent of the US food supply originates from outside the country (FDA "Food Safety Modernization Act (FSMA)"). Approximately 60 percent of all fruits and vegetables, and 80 percent of seafood is imported (FDA "Food Safety Modernization Act (FSMA)"). Foodborne diseases are a growing threat to consumers and the public due to globalization of the food supply. The FDA estimates that every year, one in six Americans experiences food poisoning, which amounts to approximately 48 million people. In 2012, the Centers for Disease Control (CDC) reported that foodborne disease outbreaks in the United States are directly linked to imported food, specifically fish and spices. At that time, CDC research revealed that approximately 45 percent of foodborne illnesses were traced to food products from Asia (CDC 2012, CDC "New Food Safety Data for 2013").

In some cases, food exports to the United States do not meet FDA mandatory standards for food safety (CDC 2012, CDC "New Food Safety Data for 2013"). In many cases, this is due to weak regulatory systems and absent standards compliance in exporting countries and US trade partners (Wallace and Oria 2013). However, the FDA reports that it can only inspect approximately 3 percent of all food imports to the United States. The increasing supply of food sourced from outside the country challenges the accountability of the FDA as an independent regulatory agency, and threatens the achievement of its statutory mission. FDA food safety regulation requires international regulatory policy cooperation to address glo-

balization and contamination of the US food system (Demortain 2008).

GLOBALIZATION OF BIOPHARMACEUTICAL DRUG SUPPLY: REGULATION OF DRGU SAFETY THREATS

The globalization of the biopharmaceutical industry is shifting manufacturing, clinical drug trials, and drug regulation outside of the United States. By 2011, China and India were the largest sources of drugs compounding of FDA-regulated biopharmaceutical drugs in the US. China, India, and Eastern European countries will continue to grow as the main sources of US drug products (FDA 2011). However, drug regulatory capacity is weak in many emerging countries and developing regions (Weisfeld and Lustig 2013). According to the United Nations WHO, globalization of biopharmaceutical companies and industry exceeds the drug regulatory capacity of many developing countries and emerging regions (WHO 2015). The FDA is actively working to build stronger global food and drug regulatory capacity across nations and regions to strengthen the agency's ability to protect public health and product safety in the United States (FDA 2013).

The FDA has limited regulatory oversight of the pre-clinical and post-market risks of these drugs. Domestic demand for biopharmaceutical drug products is increasingly filled by human and veterinary medicines produced outside of the country. By 2002, the FDA reported that approximately 40 percent of all biopharmaceutical drugs consumed in the US were produced abroad and approximately 80 percent of the active ingredients used to manufacture the drugs used in the US were imported.

FDA human and budgetary resources, as well as jurisdictional constraints, weaken the agency's ability to inspect offshore companies, factories, or ports prior to the import of food and biopharmaceutical drug products. Between 2002 and 2007, only 1 percent of foreign companies exporting food products to the United States were inspected by the FDA (FDA 2011). During the same period, less than half of all FDA foreign drug plants – 46 percent – were inspected, while over half of all foreign drug plants – 56 percent – were not inspected by the FDA for verification of biopharmaceutical drug import safety. For example, in 2012, counterfeit and mislabeled cancer drugs entered the US market (Department of Justice 2014). In the case of Mexico, the FDA intervened to stop the illegal import of unapproved medicines through black market pharmacies that operated in California (FDA 2011).

In 2012, the Food and Drug Administration Safety and Innovation Act (FDASIA) was signed into law (FDA 2015). The bill addresses the growing reliance on imported drugs and increasing threats from sub-standard, counterfeit, and adulterated human and veterinary drugs. The FDASIA requires international regulatory policy cooperation to protect the safety, effectiveness, and manufacturing quality of drugs that enter the US through the global supply chain (FDA 2015). The FDA has supported this through rulemaking to enforce the new legislation.

The FDA proposed a rule to strengthen the agency's administrative authority to detain unsafe drugs for human and animal use ("Administrative Detention for Drugs Intended for Human and Animal Use" 2014). In the past, concerns over FDA regulations as the source of

US drug shortages and drug company market restrictions limited the agency's authority to place unsafe products in administrative detention.[4] The FDA issued a rule to require agency notification of the discontinuance or disruption of biopharmaceutical drug, blood product, or vaccine supplies to prevent shortages in the human and veterinary medicine supply chains.[5]

CHALLENGES FOR FDA INTERNATIONAL REGULATORY POLICY COOPERATION

The FDA has embarked on several bilateral and international initiatives to strengthen food and drug safety regulation (FDA 2014). But in spite of the investment of human and financial resources, FDA international regulatory policy cooperation initiatives have had limited impacts. Counterfeit drugs pose an increasing threat to public health in the US. Therefore, the FDA launched a counterfeit drug initiative (FDA 2009). And yet, public concerns over growing food and drug safety threats in the US requires stronger and more formal cooperation with foreign national, regional, and international regulatory organizations, and UN standards harmonization bodies.

The FDA mechanisms for international regulatory policy cooperation include: working with trusted national and regional partners; sharing regulatory resources to achieve shared food and drug inspection goals; and establishing a foreign inspection office in foreign countries to ensure compliance with FDA regulatory goals and obligations for the protection of food and drug safety in the United States. In this context, the FDA works with foreign regulatory agencies to build regulatory capacity for food and drug safety regulation, risk assessment, and science-based standards harmonization.[6]

The implementation of the FDA Food Safety Modernization Act (FSMA) and the FDSIA (drug safety) requires stronger and more formal international cooperation by the FDA, and the rules reflect the new requirements for protection of food and drug safety in the United States. The mechanisms for international regulatory policy cooperation are already in place through existing legislation, with the ACUS and the Government Accounting Office providing oversight.

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4 ibid.

5 See Frequently Asked Questions About the Drug Shortages Programhttp://www.fda.gov/Drugs/DrugSafety/DrugShortages/ucm050796.htm#q2Drug Shortages: Non-Compliance With Notification Requirementhttp://www.fda.gov/Drugs/DrugSafety/DrugShortages/ucm403902.htmFederal Register-Permanent Discontinuance or Disruption in Manufacturing of Certain Drug or Biological Products, https://www.federalregister.gov/articles/2013/11/04/2013-25956/permanent-discontinuance-or-interruption-in-manufacturing-of-certain-drug-or-biological-products

6 The FDA has extensive bilateral, regional and international organization cooperation agreements in place to achieve its mission for the protection of food, drug and medical device safety in the United States.

FDA REGULATORY SHIFT FROM DOMESTIC RESPONSE TO INTERNATIONAL PROTECTION

The FDA Food Safety Modernization Act (FSMA) was signed into law in 2011. The FSMA policy shifts the focus of FDA operations from a response-driven to a preventive regulatory system that strengthens compliance through science-based and risk management-based standards for food safety. For example, rules under the Act strengthen the enforcement of agri-food firm and industry regulations to prevent human food and animal feed contamination.[7] The FSMA also makes provisions to strengthen compliance and enforcement of mandatory regulations for small businesses that produce and manufacture foods for the US.[8] This has included new rules for the sanitary transportation of human food and animal feed in accordance with the FSMA.[9] Another component of the bill includes a rule to require information and prior notice of food imports that have been rejected by other countries.

Many countries and regions still lack modern regulatory capacity, surveillance, and manufacturing inspection systems and are unable or unwilling to comply with FDA and global standards for the protection of food safety in the United States. The FDA works with other national and regional regulatory agencies to strengthen regulatory science, surveillance, and inspection capacity. The FSMA rules provide the following regulatory oversight mechanisms for the FDA:

Prevention through science/evidence based regulation to prevent contamination of the national food supply

- Mandatory compliance with food facilities controls
- Mandatory food produce controls
- Biosecurity authority to prevent deliberate contamination of the national food supply

Inspection and Compliance when problems occur

- Mandatory Inspection Frequency
- Records Access
- Food Testing by Accredited Laboratories

Response when prevention and inspection fails and problems occur

- Mandatory recall
- Extended mandatory detention
- Suspension of registration
- Enhanced product tracing
- Increased record keeping for high risk foods

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7 The FDA created a rule for the preventative control of human food and animal feed facilities. 1 CFR Chapter I [Docket No. FDA–2011–N–0251].

8 The FDA works to help small businesses comply with the mandatory registration requirements for food production and food safety in the United States.

9 See Federal Registrar – Sanitary Transportation of Human and Animal Food, https://www.federalregister.gov/articles/2014/02/05/2014-02188/sanitary-transportation-of-human-and-animal-food#h-11, The final rule is expected in March 2016.

Stronger and Wider Imports Authority to enforce US standards and consumer protection

- Importer accountability
- Third Party Certification
- Certification for High Risk Foods
- Voluntary Qualified Importer Program
- Authority to Detain Entry

Enhanced State/National/International Partnerships

- State and Local Capacity Building
- Foreign Capacity Building
- Reliance on Inspections by Other Agencies/Domestic and International

The FDA opened offices in several foreign countries and regions to strengthen partnerships with counterpart regulatory agencies. In light of the growing exports of food and drug products into the United States, the FDA has established offices in China, India, Latin America, Europe, the Asia-Pacific, Sub-Saharan Africa, and the Middle East. The main purpose of these global offices is to construct foreign food and drug plant and manufacturing inspections. The FDA works with counterpart regulatory agencies to inspect, verify and enforce compliance with US and global food and drug regulations, manufacturing quality, and product standards.

FOOD AND DRUG FACTORY AND GLOBAL SUPPLY CHAIN INSPECTIONS AND CERTIFICATION

The FSMA strengthens international food and drug factory inspections. During the factory inspections, the FDA and partner regulatory agencies share financial, human and technological resources to monitor the safety and security of food and drug supply chains in the countries that export products into the US domestic food and drug systems. As part of national biosecurity preparedness, the FDA's global strategy is used to monitor and to develop surveillance systems to detect, diagnose, and respond to infectious disease pandemics and deliberate bioterror attacks on the global food and drug supply chain. In this task, the FDA uses inter-agency collaboration with the Department of Health and Human Services, Department of Defense, Department of Agriculture, the Environmental Protection Agency, and international regulatory cooperation to protect the domestic food and drug system in the United States from bioterror and emerging infectious disease threats.[10] For example in the area of antibiotic drug resistance, the FDA hosts the National Antimicrobial Resistance Monitoring System in cooperation with state and local public health departments, the Department of Agriculture, and the Centers for Diseases Control. The inter-agency task force protects public health, consumer, and food safety through the inspection of meat products for the detection of antibiotic and antimicrobial drug resistance (FDA 2015).

The FDA also co-chairs the Inter-Agency Taskforce on Antimicrobial Resistance with the CDC and National Institutes of Health (NIH) (CDC 2014). The Department of Health and Human Services, Environmental Protection Agency, Department of Defense, and Department of Veterans Affairs are members of this

10 In the federal government, inter-agency cooperation is growing to improve policy implementation and regulatory agency goal attainment. In the context of firm, market and industry globalization, inter-agency cooperation is used to support international regulatory policy cooperation by US agencies.

task force to accelerate the innovation of safe and effective antibiotic drugs. In addition, the FDA and CDC now chair and host the Transatlantic Taskforce on Antimicrobial Resistance with counterpart agencies in the European Union. [11]

The FDA established inter-agency cooperation with the Department of Agriculture for public health and food inspection. In the event of biological or conventional warfare, the FDA and USDA cooperate to ensure the safety of the national food supply system.[12] For the protection of national and global food safety, the FDA cooperates with the Department of Defense.[13]

In the case of food contamination, toxicity, and pesticides, the FDA and the EPA have a formal agreement to cooperate on the surveillance and monitoring for food and drug products and drinking water.[14] The FDA also has a formal cooperation agreement for the inspections of fish and fisheries products with the U.S. Department of Commerce and the National Oceanic and Atmospheric Administration. The FDA uses inter-agency cooperation agreements to regulate domestic and imported food and drug safety.

V. OPPORTUNITES TO STRENGTHEN US FOOD AND DRUG REGULATION

The FDA Food Safety Modernization Act is the most extensive US food safety reform for over 70 years. The supporting rulemaking process for this includes several regulations and guidelines for the protection of the national food system.[15] The scale and scope of the policy requires a formal rulemaking process with Congressional oversight, inter-agency cooperation with federal and state governments, and international regulatory cooperation. The importance of food safety for consumers, industry, and the nation requires formal public stakeholder input prior to the proposal of rules. The FDA uses "notice and comment rulemaking" as set out in the Administrative Procedure Act of the US federal government, however, this has limited impact because of limited participation from public stakeholders, and stronger corporate and industry interest group mobilization.

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11 The Transatlantic Taskforce on Antimicrobial Resistance (TATFAR) was initially launched and hosted in the EU. It is now hosted by the Centers for Disease Control in the United States.

12 The FDA and USDA cooperate in peace and wartime on food safety inspections.

13 The FDA and DOD cooperate to strengthen national and global food safety in peace time, during and after conventional and biological war attacks.

14 See the Memorandum of Understanding between the FDA and EPA for evaluation pesticide and chemical contamination of food and drug products, and drinking water. http://www.fda.gov/AboutFDA/PartnershipsCollaborations/MemorandaofUnderstandingMOUs/DomesticMOUs/ucm115873.htm; http://www.fda.gov/AboutFDA/PartnershipsCollaborations/MemorandaofUnderstandingMOUs/DomesticMOUs/ucm116216.htm

15 See Food Safety Law and the Rule-Making Process: Putting the FMSA to Work http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm277706.htm#primer

The FDA organizes public meetings to solicit comments and suggestions. The FDA considers public and industry comments ahead of final rulemaking and putting in place an "effective date" for company and industry compliance with the rule. The FDA prepares and issues guidance documents to assist and support compliance. As of April 2015, the following proposed FDA rules are pending final decisions:

- Proposed Supplemental Rule for Standards for Produce Safety
- Proposed Supplemental Rule for Preventive Controls for Human Food
- Proposed Supplemental Rule for Preventive Controls for Food for Animals
- Proposed Supplemental Rule for Foreign Supplier Verification Programs for Importers of Food for Humans and Animals
- Proposed Rule for Accreditation of Third Party Auditors/Certification Bodies to Conduct Food Safety Audits and Issue Certifications
- Proposed Rule for Sanitary Transportation of Human and Animal Food
- Proposed Rule for Focused Mitigation Strategies to Protect Food Against Intentional Adulteration

ROLE OF STATES: EMERGING NATIONAL INTEGRATED FOOD AND DRUG SAFETY SYSTEMS

There are approximately 3,000 state, local, and tribal governments involved in the regulation of food safety in the United States (Wallace and Oria 2010). According to the FDA, states and local territories conduct over half the mandated FSMA food facility inspections in the United States. As result, the FDA achieves its statutory goals and agency mission through frequent domestic inspections that are carried out by states (Wallace and Oria 2010). Through a more explicit statement of federal and state cooperation, the FDA Food Safety Modernization Act strengthens cooperation with food safety agencies at the federal, state, local, territorial, tribal, and international levels. Rulemaking by states is somewhat disadvantaged due to low levels of information sharing and knowledge of national and international regulatory cooperation. The FDA rulemaking process increases the scale and scope of FDA-state relations and cooperation in national food safety. In contrast to the past, the FDA rules require that federal agency staff and the state food safety regulators and inspectors have the same training.

FDA INTER-AGENCY COOPERATION, MULTI-LEVEL REGULATION, AND LOCAL ACCOUNTABILITY

The FDA is required by the FSMA to work in close partnership with several levels of government and international regulatory authorities. For this reason, FDA international regulatory policy cooperation is creating a multi-level system of food and drug safety regulation. The creation of local, state, federal, regional, and global regulatory networks for food and drug safety is used by the FDA to address the growing complexity of market globalization and economic integration. For example, the FDA actively engages in interagency cooperation with the EPA and USDA to protect meat and food safety. At the same time, FDA inter-agency cooperation for food and drug safety is also emerging at the regional and global levels. Technology and scientific methods are used to analyze and sample meat products that enter the national food system. The new FDA rules for the FSMA and FDASIA seek to strengthen

inter-agency regulatory cooperation by establishing a universal standard of science-based risk management and evaluation of interventions.

The FSMA has created a framework for building a new National Integrated Food Safety System. The FDA builds on the approved 1998 National Food Safety Initiative for the development of a new food system in the United States.[16] In the system, the FSMA will use federal budget resources to train state governments and to build infrastructure for food safety protection.[17] Building a National Integrated Food Safety System is a complex and long-term process. To be successful in aligning state programs with the FDA's new facility inspection and compliance approach, approximately 1,000 state inspectors will need training, and the states will need real-time information-sharing capacity with the FDA and other states, state laboratory accreditation, and inspector certification programs. Should the President's 2016 budget request be approved, these on-going processes will be significantly increased to help ensure that states conduct sound, consistent inspections when industry compliance with the new preventive controls rules commences in late 2016. In addition, the FDA must build state partnerships and capacity in 2016 to provide education and technical assistance to growers in anticipation of the rule starting to be implemented in 2017.

The FDA rule for food safety modernization will converge state, territorial, and tribal programs with the federal agency's mission goal, standards, regulations, and guidance. The FDA rule requires training and certification of state officials. In this regard, information sharing capacity, laboratory enhancement, and inspection capacity and standards are required for the states to implement the prevention goals of the FSMA rule.

Local accountability of the FDA for national food and drug safety regulation is impacted by the growing scale and scope of international regulatory cooperation (Coglianese, Cary, et.al. 2008). In the case of the European Union (EU) and North American Free Trade Agreement (NAFTA) countries, growing levels of regulatory policy cooperation and science-based standards harmonization for food and drug safety challenges FDA accountability. The growing role of international regulatory policy networks in the FDA is creating a multi-level system of governance for food and drug safety that are difficult for states and local actors to penetrate (Slaughter 2001). In the multi-level system states, the federal government, regions, and global organizations are involved in the implementation of FDA food and drug regulations in the United States and abroad. However, the local accountability of international regulatory policy networks to the citizens, states, and the FDA remains unclear and under-developed. Over the last decade, the FDA regulatory mission in the US has been impacted by the need for common regulatory standards that stem from closer integration with North American and transatlantic

16 See the Federal Register documentation of the 1998 National Food Safety Initiative http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/98-045N.htm

17 Building the National Integrated Food Safety System http://www.fda.gov/downloads/ForFederalStateandLocalOfficials/UCM183650.pdfhttp://www.ncsl.org/documents/environ/Reardon.pdf

economies and markets (Shapiro 2002). FDA international regulatory policy cooperation creates new opportunities for building North American and transatlantic systems for food and drug safety.

FDA FOOD SAFETY REGULATION COOPERATION IN NORTH AMERICA

In the case of the NAFTA, regulatory policy cooperation requires common regulatory policies in the United States, Canada, and Mexico (Office of Management and Budget 2013). The FDA works closely with the governments and regulatory authorities in Mexico and Canada to strengthen regulatory capacity. As major trading partners of the US, the FDA is currently building stronger regulatory policy cooperation with Canada and Mexico. The FDA is currently engaged in joint action plans and program development with Canada and Mexico to develop common approaches and standards to food safety regulation (White House 2014).

Mexico is a major exporter of fresh and processed foods to the United States. The FDA is expanding international regulatory cooperation with counterpart agencies in the Mexico to accelerate food safety modernization for the protection of the US national food system (White House 2012). However, the FDA does not engage with Mexico on drug regulation cooperation.

Regulatory policy cooperation is stronger with Canada than Mexico (White House 2014). The FDA uses international regulatory policy cooperation with Canada to strengthen the safety of drug imports. However, the FDA does not have food safety cooperation agreements with Health Canada. Instead, US livestock and meat products are regulated through the U.S. Department of Agriculture's regulatory cooperation with its Canadian Food Inspection Agency counterpart.

FDA FOOD AND DRUG SAFETY COOPERATION WITH THE EUROPEAN UNION

The FDA has an extensive relationship with its counterpart agencies in Europe. In 2007, the US and the EU launched the Transatlantic Economic Council, which now serves as the formal framework for regulatory policy cooperation and acceleration of economic and market integration between the United States and the European Union (Vogel 2012). In the Transatlantic Economic Council, the FDA and European Medicines Agency cooperate on biopharmaceutical drug safety, effectiveness, and quality regulation. The US and the EU also cooperate on manufacturing standards enforcement and inspections in other countries (FDA 2014). In spite of highly publicized regulatory conflicts and competition over food and drug safety regulation, the FDA works closely with the European Commission, European Food Safety Authority, and European Medicines Agency to converge and harmonize food and drug safety regulations.

In 2013, President Barack Obama announced the launch of formal negotiations for the Transatlantic Trade and Investment Partnership (TTIP).[18] The goal of the TTIP agreement

18 See joint US and EU press release announcement from the United States Trade Representative (USTR) February 2013 US-EU Presidents. www.ustr.gov .Also see European Commission Directorate General for Enterprise and Industry/ Transatlantic Economic Council – www.ec.europa.eu. While the global eco-

is to create an integrated transatlantic market system. The TTIP agreement will create common regulatory policies, public laws, and standards for global trade, industries, and market regulation. The FDA and European Food Safety Authority will work in cooperation to protect food safety and animal health in the US, EU, and transatlantic region.

The FDA and European Food Safety Authority have food safety regulation and standards issues that are being addressed prior to the passage of the TTIP agreement. The FDA and the European Medicines Agency have extensive drug safety, manufacturing, and other biopharmaceutical drug regulation cooperation agreements. Over the last decade, the FDA and the European Medicines Agency established the following regulatory agreements for drug safety: collaboration on transatlantic and global inspections, combatting counterfeit drugs, new biopharmaceutical drug development and accelerated innovation, and drug safety reporting for clinical drug trials and parallel scientific advice.

In addition, the US and the EU work closely in international organizations for drug regulatory standards harmonization. The FDA participates in the International Conference on Harmonization of Technical Requirements for Registration of Pharmaceuticals for Human Use. Within this framework, the FDA proposed and launched the International Pharmaceutical Regulators Forum to accelerate national and regional drug regulatory capacity in developing and emerging countries.[19] In the area of veterinary medicines, the FDA is a member of the International Conference on Harmonization of Technical Requirements for Registration of Veterinary Medical Products.

FDA MULTILATERAL COOPERATION FOR GLOBAL FOOD AND DRUG SAFETY

As the complexity of industry and market globalization increases, the FDA works in cooperation with international organizations and the UN scientific standard harmonization. The harmonization of national and regional regulations, standards, and laws is required to protect food and drug safety, public health, and national biosecurity. FDA rulemaking and strategic goals use international agreements and participation in international organizations to protect the American food and drug system.

In the area of food safety regulation, the FDA works on global agriculture, animal livestock, and food trade standards with the following organizations: Codex Alimentarius, UN World Health Organization, the World Organization for Animal Health, and the Food and Agriculture Organization.[20] The FDA ultimately uses

nomic crises affects all nations and regions, transatlantic economic integration is driven by accelerated science cooperation and technology innovation for market growth and knowledge based job creation.

19 See International Pharmaceutical Regulators Forum https://www.google.com/search?client=safari&rls=en&q=ICH+-+global+regulator+forum&ie=UTF-8&oe=UTF-8

20 FDA Office of Global Regulatory Operations and Policy http://www.fda.gov/AboutFDA/CentersOffices/OfficeofGlobalRegulatoryOperationsandPolicy/OfficeofInternationalPrograms/ucm236581.htm; https://www.federalregister.gov/

international regulatory policy cooperation to build food and drug safety regulatory policy networks. The global regulatory networks and coalitions of food and drug regulators are now required to achieve the FDA's mission and regulatory responsibilities. However, the FDA is accountable to the US government, industry, citizens, and society. FDA accountability to the public is increasingly challenged by international regulatory policy networks (Slaughter 2001).

IV. CONCLUSIONS: CHALLENGES AND OPPORTUNITIES FOR NATIONAL FOOD AND DRUG SAFETY

Globalization of FDA operations and rulemaking is deeply embedded within food and drug safety regulation in the United States. The globalization of markets, industry, and free trade increase food and drug safety risks to American consumers and public health. The globalization of national food and drug systems have exceeded the FDA's ability to protect American consumers and the nation's public health. International regulatory policy cooperation is an emerging and important regulatory policy instrument for FDA rulemaking, mission achievement, and enforcement.

FDA international regulatory policy cooperation increasingly requires stronger public and citizen accountability and transparency in the area of food and drug safety regulation. The FDA is accountable to Congress and citizens, and the growing role of international regulatory agencies and standards is becoming a challenge for the democratic process and specifically the ability for non-global, non-industry actors to understand and to participate in rulemaking processes. This is currently playing out in the US and the EU over food safety regulation and standards harmonization in the TTIP agreement (EurActive 2014). While transatlantic companies and industries developed and want the TTIP agreement, there is concern by the public over differences in food safety regulation in the US and EU.

STRENGTHENING US AND GLOBAL FOOD AND DRUG SAFETY

Globalization and free trade are driving the growing use of international regulatory policy cooperation and global networks by the FDA. The use of international regulatory policy cooperation strengthens the capacity of the FDA in many ways. For example, it provides stronger regulatory tools and resources for the prevention, detection, and removal of threats to food and drug safety in the United States, and it enables the FDA to increase focus on public health and biosecurity threats to US national food and drug systems. At the same time, globalization challenges the fundamental goals and obligations of the FDA to protect food and drug safety, public health and consumers in the United States.

Since the FDA only has jurisdiction in the United States, protection of the national food and drug safety and public health require extraterritorial support. Beyond safety impacts, overtime, FDA use of international regulatory policy cooperation will strengthen the competitiveness of US food and drug exports by removing non-tariff barriers to trade.

articles/2013/08/02/2013-18631/cooperative-agreement-to-support-the-food-and-agriculture-organization

International regulatory policy cooperation offers new opportunities for the FDA to achieve its statutory goals and agency mission. Ultimately, international regulatory cooperation supports the FDA mission through the convergence and harmonization of foreign regulations to FDA science-based regulatory policy standards (Stewart 2005). In this regard, the FDA achieves its domestic mission through increasing regulatory participation, support, and inspection-sharing with comparable foreign counterparts and international standards-setting bodies. Furthermore, the FDA achieves cost-savings through information exchange, factory and facility inspection sharing, and standards verifications and compliance

CHALLENGES OF INTERNATIONAL REGULATORY POLICY COOPERATION FOR FDA RULEMAKING

In the case of the FDA international regulatory cooperation, the issues of development and/or enforcement of US public laws, regulations, and standards must be clarified in the rulemaking process. The clarification process must address the impact of globalization on the FDA, inter-agency collaboration, and international regulatory policy cooperation for food and drug safety in the United States. In the past, the FDA and other agencies have engaged in international regulatory policy cooperation to develop more a comprehensive regulatory framework and rules for the domestic policy environment.

In order to strengthen the transparency around international regulatory cooperation, during FDA consultation of the rulemaking process, foreign government bodies and US inter-agency partnerships that are used to fulfill the agency's mission should be identified. The nature and levels of international regulatory policy cooperation should be noted, for example, stating the exchange of information and coordination of national regulatory agency missions and goals in consultation prior to formal rulemaking or with reciprocal participation during rulemaking processes.

Through the use of increasing levels of mutual recognition and regulatory convergence, the FDA and other US regulatory agencies are developing a range of options for international regulatory policy cooperation. In the case of NAFTA, a tripartite framework is used to coordinate FDA regulatory policies and missions with counterpart agencies in Canada and Mexico. In contrast, the FDA mission as a science-based regulatory agency supports stronger international regulatory policy cooperation with counterpart agencies in the European Union. However, the pending TTIP agreement will require stronger alignment of US and EU regulatory missions and food and drug safety policies for the FDA to fulfill its statutory obligation to the US domestic system. To achieve this, formal and direct discussion of regulatory harmonization and agency convergence is needed by government, industry, the scientific community, and civil society.

The FDA rulemaking consultation process must address international regulatory policy cooperation in the context of the FDA's domestic mission – the regulation of the national food and drug systems. In light of the balance of authority and power that rests with the states, the challenges for the FDA will increase due to the complexity of industry globalization, free trade agreements, and international regulatory standard-setting bodies such as

the World Trade Organization, the UN World Health Organization, the World Organization for Animal Health, and the UN Food and Agriculture Organization. It is important that states, territories, and other units of government are fully involved and have the capacity to understand the impacts of internationally agreed standards for food and drug safety.

V. REFERENCES

ACUS. *Recommendation 91-1: Federal Agency Cooperation with Foreign Government Regulators.* ACUS, June 13, 1991. https://www.acus.gov/sites/default/files/documents/91-1.pdf.

Aman, Alfred. "The Limits of Globalization and the Future of Administrative Law: From Government to Governance." *8 Indiana Journal of Global Legal Studies* 347 (2001) 8, no. 2 (April 1, 2001): 379–400.

"Assessing National Medicines Regulatory Systems." *World Health Organization*, 2015. http://www.who.int/medicines/areas/quality_safety/regulation_legislation/assesment/en/.

"Administrative Detention for Drugs Intended for Human and Animal Use." In *Federal Register*, 2014. https://www.federalregister.gov/articles/2014/02/05/2014-02188/sanitary-transportation-of-human-and-animal-food#h-11.

Black, Julia. "Constructing and Contesting Legitimacy and Accountability in Polycentric Regulatory Regimes." *Regulation & Governance 2, no. 2* (June 1, 2008): 137–64. doi:10.1111/j.1748-5991.2008.00034.x.

CDC. "About ITFAR." July 14, 2014. http://www.cdc.gov/drugresistance/itfar/about.html.

CDC. "CDC Online Newsroom - CDC Research Shows Outbreaks Linked to Imported Foods Increasing, March 14, 2012," March 14, 2012. http://www.cdc.gov/media/releases/2012/p0314_foodborne.html.

Coglianese, Cary, et.al.(2008)Transparency and Public Participation in the Rulemaking Process, A Nonpartisan Presidential Transition Task Force Report. University of Pennsylvania, pp. 2-10.

Commissioner, Office of the. "Federal Food and Drugs Act of 1906." WebContent, May 20, 2009. http://www.fda.gov/RegulatoryInformation/Legislation/ucm148690.htm.

———. "Food and Drug Administration Safety and Innovation Act (FDASIA)." WebContent, January 29, 2015. http://www.fda.gov/RegulatoryInformation/Legislation/FederalFoodDrugandCosmeticActFDCAct/SignificantAmendmentstotheFDCAct/FDASIA/#supplychain.

———. "Reports - FDA Strategic Priorities: 2014 - 2018." WebContent, September 30, 2014. http://www.fda.gov/AboutFDA/ReportsManualsForms/Reports/ucm227527.htm.

Custos, Dominique. "The Rulemaking Power of Independent Regulatory Agencies." T*he American Journal of Comparative Law* 54 (October 1, 2006): 615–39.

Demortain, David. "Standardising through Concepts: The Power of Scientific Experts in International Standard-Setting." *Science and Public Policy* 35, no. 6 (July 1, 2008): 391–402. doi:10.3152/030234208X323325.

Drahos, Peter, and John Braithwaite. "The Globalisation of Regulation." *Journal of Political Philosophy* 9, no. 1 (March 1, 2001): 103–28. doi:10.1111/1467-9760.00120.

FDA. "Buying Medicines Over the Internet - FDA Consumer Safety Alert: Don't Buy These Drugs over the Internet or from Foreign Sources." WebContent, April 27, 2015. http://www.fda.gov/Drugs/ResourcesForYou/Consumers/BuyingUsingMedicineSafely/BuyingMedicinesOvertheInternet/ucm202893.htm.

———. "Enforcement Story." WebContent, April 27, 2015. http://www.fda.gov/ICECI/EnforcementActions/EnforcementStory/.

———. "FDA Initiative to Combat Counterfeit Drugs." September 9, 2009. http://www.fda.gov/Drugs/DrugSafety/ucm180899.htm.

———. "FDA Operation Reveals Many Drugs Promoted as." WebContent, April 27, 2015. http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2005/ucm108534.htm.

———. *FDASIA Title VII Drug Supply Chain Provisions,* January 2015. http://www.fda.gov/RegulatoryInformation/Legislation/FederalFoodDrugandCosmeticActFDCAct/SignificantAmendmentstotheFDCAct/FDASIA/ucm365919.htm.

———. *Global Engagement - The U.S. Food and Drug Administration,* April 18, 2012. http://www.fda.gov/downloads/AboutFDA/ReportsManualsForms/Reports/UCM298578.pdf.

———. "Global Initiative." WebContent. *FDA's Global Engagement Activities and Resources on Globalization*, April 26, 2015. http://www.fda.gov/AboutFDA/GlobalInitiative/.

———. "History." WebContent, April 27, 2015. http://www.fda.gov/AboutFDA/WhatWeDo/History/.

———. "The National Antimicrobial Resistance Monitoring System." April 13, 2015. http://www.fda.gov/AnimalVeterinary/SafetyHealth/AntimicrobialResistance/NationalAntimicrobialResistanceMonitoringSystem/default.htm.

———. "Overviews on FDA History - The Story of the Laws Behind the Labels." WebContent, April 27, 2015. http://www.fda.gov/AboutFDA/WhatWeDo/History/Overviews/ucm056044.htm.

———. *Pathway to Global Product Safety and Quality*, July 7, 2011. http://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofGlobalRegulatoryOperationsandPolicy/GlobalProductPathway/UCM262528.pdf.

———. "Press Announcements - FDA Unveils New Global Strategy to Help Ensure Safety and Quality of Imported Products." WebContent, April 26, 2015. http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm259848.htm.

"FDASIA Title VII Drug Supply Chain Provisions." FDA, January 29, 2011. http://www.fda.gov/RegulatoryInformation/Legislation/FederalFoodDrugandCosmeticActFDCAct/SignificantAmendmentstotheFDCAct/FDASIA/ucm365919.htm.

"Food and Drug Administration Safety and Innovation Act (FDASIA)." FDA, January 29, 2015. http://www.fda.gov/RegulatoryInformation/Legislation/FederalFoodDrugandCosmeticActFDCAct/SignificantAmendmentstotheFDCAct/FDASIA/.

GAO. *International Regulatory Cooperation: Agency Efforts Could Benefit from Increased Collaboration and Interagency Guidance*, August 1, 2013. http://www.gao.gov/assets/660/656488.pdf.

Harris, Gardiner. "Medicines Made in India Set Off Safety Worries." *The New York Times*, February 14, 2014. http://www.nytimes.com/2014/02/15/world/asia/medicines-made-in-india-set-off-safety-worries.html.

"H.R. 2751 - Public Law (111th Congress), 111-353, 124 STAT.3885." Legislation, January 4, 2011. http://www.gpo.gov/fdsys/pkg/PLAW-111publ353/pdf/PLAW-111publ353.pdf.

"Imported Drugs Raise Safety Concerns." FDA, August 24, 2011.

Institute of Medicine. "The Future of Drug Safety: Promoting and Protecting the Health of the Public." *Institute of Medicine*, September 22, 2006. https://www.iom.edu:443/Reports/2006/The-Future-of-Drug-Safety-Promoting-and-Protecting-the-Health-of-the-Public.aspx.

Jacobs, Scott H. "Regulatory Co-operation for an Interdependent World: Issues for Government", in OECD. 1994. Regulatory Co-operation in and Interdependent World – Public Management Studies, Paris, France.

Levi-Faur, David. *Handbook on the Politics of Regulation.* Edward Elgar Publishing, 2011.

McCarthy, Michael. *International Regulatory Cooperation 20 Years Later: Updating ACUS Recommendation 91-1.* ACUS, October 19, 2011. https://www.acus.gov/sites/default/files/documents/International-Reg-Cooperation-Report.pdf.

Michael Ward. "Global Cooperation Group." presented at the ICH Public Forum, October 13, 2010. http://www.fda.gov/downloads/Drugs/NewsEvents/UCM229757.pdf.

"New Food Safety Data for 2013 | Spotlight | Food Safety | CDC," May 8, 2014. http://www.cdc.gov/foodsafety/spotlight/food-safety-data-2013.html.

Nutrition, Center for Food Safety and Applied. "Food Safety Modernization Act (FSMA) - Food Safety Legislation Key Facts." WebContent, April 27, 2015. http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm237934.htm.

Office of Management and Budget. 2014. "North America-Regulatory Policy Cooperation." https://www.whitehouse.gov/omb/oira_irc_north_america.

Pathway to Global Product Safety and Quality. US Food and Drug Administration, July 7, 2011. http://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofGlobalRegulatoryOperationsandPolicy/GlobalProductPathway/UCM262528.pdf.

Peel, Jacqueline. *Science and Risk Regulation in International Law.* Cambridge University Press, 2010.

Pew Charitable Trusts. "Pew Issue Brief: Heparin- A Wake-Up Call on Risks to US Drug Supply," April 27, 2015. http://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2012/05/16/heparin-a-wakeup-call-on-risks-to-the-us-drug-supply.

"S. 3187 - Public Law (112nd Congress), 112-144, 126 STAT. 993." Legislation, July 9, 2012. http://www.gpo.gov/fdsys/pkg/PLAW-112publ144/pdf/PLAW-112publ144.pdf.

Shapiro, Sydney A. 2002."International Trade Agreements, Regulatory Protections and Public Accountability," *Administrative Law Review*, Vol. 54, No.1.

Slaughter, Anne-Marie. 2001. "The Accountability of Government Networks." *Indiana Journal of Legal Studies*. Volume 8, Issue 2.

Strauss, Peter L. *Rulemaking in the Ages of Globalization and Information: What America Can Learn from Europe, and Vice Versa*. SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, January 31, 2006. http://papers.ssrn.com/abstract=879770.

Stewart, Richard, B. 2005. "US Administrative Law: A Model for Global Administrative Law?" *Law and Contemporary Problems*, Volume 68, NO. 3-4, pp.63-108.

Timmermans, Stefan, and Steven Epstein. "A World of Standards but Not a Standard World: Toward a Sociology of Standards and Standardization*." *Annual Review of Sociology* 36, no. 1 (2010): 69–89. doi:10.1146/annurev.soc.012809.102629.

"Turkish Man Sentenced for Smuggling Counterfeit Cancer Drugs." US Department of Justice, Juen 2014. http://www.fda.gov/ICECI/CriminalInvestigations/ucm420869.htm.

US-EU High Level Regulatory Cooperation Forum. *Report on the Use of Voluntary Standards in Support of Regulation in the United States,* October 2009. http://gsi.nist.gov/global/docs/Voluntary_Standards_USRegs.pdf.

Vogel, David, and Robert A. Kagan. "Dynamics of Regulatory Change: How Globalization Affects National Regulatory Policies," 1–40. University of California Press, 2004.

Wallace, Robert B., and Maria Oria, eds. *Enhancing Food Safety: The Role of the Food and Drug Administration.* Washington: National Academies Press, 2010.

Wallach, Lori. *Hearing on Protecting Public Health in a Global Economy,* 2009. https://www.citizen.org/documents/WallachTestimony_GlobalizedFoodSupplySafety.pdf.

Weisfeld, Victoria, and Tracy A. Lustig, eds. *International Regulatory Harmonization Amid Globalization of Drug Development: Workshop Summary.* National Academies Press, 2013.

Wessel, Ramses A., and Jan Wouters. "The Phenomenon of Multilevel Regulation: Interactions between Global, EU and National Regulatory Spheres." *International Organizations Law Review* 4, no. 2 (December 1, 2008): 259–91. doi:10.1163/157237308X278232.

White House. 2012. United States-Mexico High Level Regulatory Cooperation Council Work Plan. Washington DC, pp. 4-5.

White House. 2014. United States – Canada Regulatory Cooperation Council – Joint Forward Plan. Washington DC, pp. 31-34.

The Case for Effective Electricity Regulation

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This paper examines the case for independent and effective electricity regulation. After a brief background on the evolution of electricity regulation and common regulatory frameworks in existence today, key structural and financial requirements with respect to regulatory independence and effectiveness are discussed. Examples from existing global structures and best practice are used to understand the key components of an effective regulatory structure. There is a particular focus on independence and credibility, composition and staffing, oversight, budgetary independence, and transparent decision-making structures and processes. The paper concludes by discussing recommendations that should play a critical role in ensuring delivery of value to consumers in an affordable and environmentally responsible manner.

I. INTRODUCTION

In late November 2014, the United Kingdom's main gas and electricity regulator, the Office of Gas and Electricity Markets (Ofgem), rejected the business plans of five out of the six privately owned electricity network providers, citing that they could do more to "deliver value to customers" (Murray 2013). This decision by Ofgem will require these organizations to invest approximately £17 billion to maintain and improve the existing electricity network, which also guarantees a significant share for electricity generation from renewable sources. More significantly, Ofgem finalized price controls, effective April 2015, that are expected to transfer approximately £900 million in cost savings to consumers over an eight year period (Warner 2014). This step by Ofgem sends a strong message to network providers and consumers and highlights how a strong and independent regulator can act to safeguard consumer welfare while ensuring much needed investment in public infrastructure without burdening the public exchequer and incurring related macroeconomic consequences.

One would think that measures such as Ofgem's should be quite common, but this is not

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the case. Across the world, there are few regulators that have Ofgem's long-term vision and purpose. The more common situation is one that was seen in Bulgaria in early 2013, when consumers received electricity bills that were two times higher than those of the previous month. The Bulgarian electricity market was similarly structured to that of the UK, with three privately owned electricity network providers overseen by the State Commission for Energy and Water Regulation (SCEWR) (*The Economist* 2013). Allegedly, the companies estimated electricity bills using complex and illegal formulas that contributed to a complete lack of accountability to the government and regulator. The situation reached a climax in January 2013 with widespread street protests across the country, and finally culminated in the fall of the government (*The New York Times* 2013).

What both the aforementioned examples emphasize is that provision of essential services such as electricity is a critical and emotive issue for consumers. Electricity is an important development resource as it facilitates the provision of energy services that can be used to further other development priorities such as healthcare and education. Electricity is also a key production input for agriculture and industry. The overall importance of electricity as an economic resource also lends it considerable political salience. Consequently, the electricity regulator plays a central role in the success or failure of the electricity market in any country. The purpose of this paper is to examine the case for independent and effective electricity regulation for markets that are dominated by either public or private sector electricity providers. After looking at several case studies, it appears that there are a few vital elements that are necessary for an effective regulator to flourish. These revolve around ensuring independence and credibility and span across governance mechanisms such as composition and staffing, oversight, budgetary independence and steady sources of funding, and independence and transparency in decision-making structures and processes. These issues are particularly salient for countries that do not have a history of independent regulation or are considering the establishment of an independent electricity regulator to bring about vital and long-term improvements in their electricity utility industry.

This paper is structured in the following manner. In the next section, I provide a brief background and history of how regulation in the electricity sector has evolved since the late 1800s and compare common regulatory frameworks. In the third section, I discuss key structural and financial requirements that are related to regulatory independence and effectiveness. I also highlight some best practices as well as ineffective and counterproductive regulatory approaches found in developed and emerging markets. Section IV concludes by reiterating the criticality of effective regulation in ensuring delivery of value to consumers in an affordable and environmentally responsible manner.

II. REGULATORY REGIMES TODAY

A BRIEF HISTORY OF THE EVOLUTION OF ELECTRICITY REGULATION

The origins of electricity regulation can be found in the early 20th century in the United States and Europe. The nascent electricity industry, founded in the final quarter of the 19th century, consisted of mostly urban private suppliers who required a special franchise issued

by the municipal corporation. These early days provided fertile ground for predatory behavior: there was no structure or process followed in issuing franchises, and municipal corporations, often in cahoots with corporations, exploited consumers and/or enriched themselves (Geddes 1992). Corporations also engaged in price discrimination, charging higher rates for rural and far-flung communities (Valentine 2011). The prevalent issues of the emerging industry had political salience, which laid the foundation for more centralized regulation, and also served to safeguard public interest by achieving the most efficient allocation of public resources (Valentine 2011). By 1907, the American states of Wisconsin and New York led the way by enacting far-reaching laws to establish powerful state commissions that superseded the authority of municipal corporations. Most states followed suit, and this structure has largely remained in place since then. Privately owned utilities are regulated by the government (Geddes 1992).

The UK followed a slightly different path. In the 1920s, central control of the electricity sector was enhanced through the creation of a "national gridiron" which later evolved into the National Grid (Horrocks and Lean 2011). By 1938, the entire industry for England, Wales, Scotland, and Northern Ireland had been nationalized and by 1947, the British Electricity Authority (BEA) was established with the responsibility for generation and transmission as well as policies and finance (Horrocks and Lean 2011). The US did not see nationalization at this level, though it did establish the Federal Power Commission (now the Federal Energy Regulatory Commission), whose role was to coordinate larger issues that transcended state borders (Geddes 1992). In 1989, the UK finally moved to an industry structure more aligned with that of the US, shifting away from a state-owned vertically-integrated model to a market-driven model based on private suppliers. An independent regulatory system was set up, headed by the Director General of Electricity Supply who would be supported by the Office of Electricity Regulation (OFFER). A board, the Gas and Electricity Markets Authority, later replaced OFFER and a single regulatory office, the Office of Gas and Electricity Markets (Ofgem), for both the gas and electricity sectors was created.

The move to a more centralized state or national regulatory structure finds support and opposition. An argument in support refers to the "natural monopoly" nature of the electricity utility industry, which holds that one firm can serve the entire market more efficiently and cheaply than two or more firms. Thus, the government allows the firm a regional monopoly so that the firm can earn a "fair" rate of return on its cost and investment (Geddes 1992). The argument opposing a national regulatory structure holds that since municipal regulation encourages competition, state regulation is more able to protect producers and serve their own private interests. Producers could use regulations to insulate themselves from competition, and thus operate in a monopoly and realize monopoly profits (Geddes 1992). This view has its origins in the theory of regulatory capture, developed mainly by George Stigler (1971). Regardless of the advantages or disadvantages, this current model of state regulation has largely remained in place.

COMPARISONS OF VARIOUS REGULATORY APPROACHES

The regulatory structures found in developed nations dominate. Developing countries have typically modeled their organizations closely on different variations present in the developed world, specifically OECD countries (Eberhard 2006).

The following categorization is helpful in distinguishing the most prominent structures and dynamics, and for understanding why certain structures and features exist today.

ANGLO-AMERICAN MODEL

Countries with colonial ties to Great Britain share many elements of their regulatory regimes (Eberhard 2006). Characteristics of this framework include independent regulatory agencies that operate in a legal system based on common law. The regulator is responsible for tariffs and service standards. It has considerable, though bounded, discretion in its decisions, for which it can be held accountable (Eberhard 2006). However, there are significant distinguishing features between the UK and US systems in terms of how that discretion is bounded. In the US, the model of state regulation has always focused on providing producers and distributors with a significant amount of operational autonomy, whereas in the UK, incremental legislative change has been directed at strengthening the independence and oversight of the national regulatory bodies.

The US framework is characterized by a strong and well-established written constitution, an administrative legal code, and dispute and issue resolution traditionally through the legal system (Eberhard 2006). Other important features include financial, administrative, and decision-making independence of regulators. However, even with this, US regulatory authorities do not enjoy a high degree of discretion. The judiciary plays an active role in interpreting regulatory statutes and does place limits on discretionary powers of US regulators (Brown et al. 2006). In contrast, the UK framework places more focus on achieving compromise between stakeholders, rather than resorting to the legal system and judiciary to resolve disputes and issues (Eberhard 2006). Systems based on the UK construct are generally bounded by legislation, case law, and evolving regulatory practices (Besant-Jones 2006). One key difference between the UK and the US regulatory regimes is the tariff-setting process, which is more informal in the UK (Brown et al 2006). For example, in Australia (which closely follows the UK framework), independent electricity regulators in states employ workshops, roundtables, and forums to determine tariff changes (Brown et al. 2006). Federal and inter-provincial issues fall under the ambit of the national competition and consumer protection agency, the Australia Competition and Consumer Commission. This contrasts with US, which has instituted the Federal Energy Regulatory Commission to determine tariffs (Brown et al. 2006).

CONTINENTAL EUROPEAN MODEL

Traditionally found in countries with colonial links to continental Europe (especially France and Spain), these systems are dispersed systems that generally operate within civil law codes and have a tremendous focus on public service obligations (Eberhard 2006). While there is usually no separate regulator, regulatory contracts are the norm. For example, concession contracts transfer operating rights while also observing regulatory norms. In addition, there

are provisions for contract renegotiation and arbitration (Eberhard 2006). In the French system, the highest court, or Conseil d'Etat, can legally enforce the contract as well as develop legal doctrines that shape and constrain contracts (Brown et al. 2006).

This system relies heavily on a concession contract. The key aspect here is that the contract is not between a regulator and a utility provider as observed in Anglophone countries (Eberhard 2006). The contract is usually between the local or national administration (such as a municipality or national ministry) and the utility provider. The administration acts as a representative or agent for consumers and producers with the private operator. Utility operating rights are transferred to private enterprises for a fixed duration of time as stipulated in the contract. The administration acts as a regulator by imposing regulatory obligations on the operator such as maximum tariff levels, quality standards, requirements to serve certain segments of customers, and procedures for the transfer and disposal of assets. Thus, no separate independent regulator is envisaged in this system as regulatory functions are performed by the government or local administration. The government and private operator have freedom to design the contract, which is usually enforced by the highest court of the land. Some have suggested that the court plays the role of a "quasi-regulator" or "super-regulator" as it is responsible for the critical regulatory function of resolving disputes between customers (government and local administration) and suppliers (private operators) (Brown et al. 2006).

HYBRID MODELS

Hybrid models that combine features of the two aforementioned frameworks incorporate the existence of regulatory contracts along with independent regulators. For example, Uganda (a former British colony with an Anglo legal tradition) has an independent electricity regulator, known as the Electricity Regulatory Authority, which was established and functionally outlined in the Electricity Act of 1999 (Electricity Regulatory Authority of Uganda 2013). This body has recently enacted long-term concession contracts ranging from 10 to 30 years for the purpose of electricity generation, transmission, bulk supply, distribution, and sale (Electricity Regulatory Authority of Uganda 2013). Other examples from Africa are Mali and Cameroon, countries with ties to France that have put in place concession contracts and established independent regulators (Eberhard 2006). Brazil and Romania, civil law based countries, have also combined independent regulators with pre-specified tariff-setting regimes (Brown et al. 2006). Erstwhile British colonies in Africa such as Zambia and Kenya have independent regulators that are expected to act in the public interest (Brown et al. 2006). Francophone countries such as Gabon exercise concession contracts overseen and regulated by administrative law and a dedicated Ministerial Unit; no separate regulator is observed (Brown et al. 2006). Senegal also regulates its water supply via an affermage contract (where the private operator only has operational responsibilities, no investment responsibilities) rather than an independent agency (Brown et al. 2006).

COMPARING THE MODELS

The key philosophy of the Anglo-American approach is the depoliticization of economic

regulation: establishing an independent regulator in order to remove politics and government from the activities involved in regulation (Brown et al. 2006). This has elements of both public and private interest theories of regulation. A regulator is required to maximize public interest by ensuring that market failures do not arise, and the regulator needs to be independent and free from political interference to ensure that "regulatory capture" does not happen. Removing governments and politicians from the decision-making ambit of regulatory agencies is intended to minimize opportunities for vote maximization and to reduce wealth transfers between different interest groups (Eberhard 2006). Regulators can do more to balance competing interests between stakeholders such as producers and consumers, and therefore aim to maximize public interest (Eberhard 2006). Moreover, while it is the responsibility of the government to ensure that essential services such as electricity, water, and gas are provided continuously, it is not the responsibility of the government to provide these services. Private enterprises are free to provide these services (and own related assets) as long as they meet the aforementioned public interest considerations. In practice though, most regulated entities are subject to limits on what they can and cannot do (Brown et al. 2006).

The European approach stems from the belief that the concept of an independent regulator is naïve and unworkable, as evidenced in the theory of regulatory capture. This is in contrast to the Anglo-American model that advocates for a strong government role in regulation. The Continental European model addresses the pitfalls of political interference by specifying obligations and responsibilities and creating a well-functioning backup dispute resolution system. A greater philosophical divergence from the Anglo-American model is reflected in the belief that the provision of a public service, such as electricity, is essentially a government responsibility. The government may choose to contract out the management of this responsibility, but it still retains ownership of the assets. In many countries, local and central governments are prohibited from selling utility assets to private companies, which demands the use of concession contracts. Even some countries like Uganda and Lesotho that permit full asset sales have chosen the concession contract model rather than full privatization, due to caution of the political repercussions of privatization.

III. ENSURING REGULATORY INDEPENDENCE AND EFFECTIVENESS

Regardless of philosophical orientation, any regulatory regime needs certain basic foundations to function effectively. Many structural decisions have a direct impact on the role, independence, and functions of electricity regulators. These decisions also have an impact on the state of the market, which itself affects the quality of services provided to consumers. Considerations about the mandate of the regulator, the scope of its activities and jurisdiction, and the extent to which it is autonomous with respect to financing all have implications for its independence, which, in turn, affect performance. These issues are particularly salient for countries that do not have a history of independent regulation or are considering the establishment of an independent electricity regulator to bring about required and long-term improvements in their electricity utility industry.

Based on an analysis of a number of international miniature case studies, four features are recommended in order to develop and to protect the independence and effectiveness of regulators. These recommendations are fundamental enough that they can work in either model. However, as they relate directly to an independent regulatory authority, perhaps they would be more synergistic with the Anglo-American framework where such bodies are found. The recommendations are:

1. An independent regulator should be statutorily empowered to independently set tariffs;

2. The credibility and independence of a regulator should be a central goal during its creation, supported by robust selection and staffing policies and utilization of external experts;

3. Board composition and structure should facilitate transparent, calculated, and sustainable decision-making procedures; and

4. There should be safeguards for funding sources and budgetary control independent of the government.

Regulatory effectiveness is deeply intertwined with the relationship between the government, independent regulator, and the utility service providers. Interactions that comprise a working relationship stem from the prescribed division of responsibilities enshrined in legislation. For example, in India, electricity is a "concurrent" subject under the Indian constitution and thus falls under the purview of both central and state governments (Dubash and Rao 2006). Generation, transmission, distribution, and sale are the responsibility of publicly owned State Electricity Boards (SEB), which are both commercial entities and instruments of development policy. No independent regulator existed prior to the turn of the twenty-first century. This mixing of roles of the SEBs resulted in tremendous political interference at both the central and state level, resulting in inefficiency, insolvency, incompetence, and widespread graft (Dubash and Rao 2006). There is thus an element of regulatory capture. However such a system also suffers from excessive "politicization".

AN INDEPENDENT REGULATOR SHOULD BE STATUTORILY EMPOWERED TO INDEPENDENTLY SET TARIFFS

One way of addressing this issue is to set up an independent regulator that is statutorily empowered to independently set tariffs. Even in such a scenario, political involvement is unavoidable, but the regulator can minimize its impact by seeking to balance competing interests and ensure the financial health of utilities. Another Indian example from the southern state of Andhra Pradesh illustrates how this can be accomplished effectively. The regulator worked with the utility responsible for transmission to undertake management reforms such as the improvement of services to well-paying industrial customers by setting up dedicated lines and giving them preferential access to scarce power. This increased revenues significantly, which allowed the utility to keep tariffs fixed for subsidized consumer groups. These gains were consolidated by setting performance targets for utilities. The key pillars of this process were a significant amount of negotiation outside the formal regulatory process and the introduction of measures of transparency that restrict the postponing of

difficult decisions for the future (Dubash and Rao 2006).

Detailed agreements with performance targets may lead to a reduction in the power of the regulator. Reforms in the Indian state of Delhi had precisely this result, even though the preferred mode of reform was privatization of previously state owned utilities. The initial contract signed between the state government and the private operator stipulated performance targets, thus removing them from the control of the regulator. The government also further limited the authority and scope of the regulatory authority by setting the rate of return and mandating uniform tariffs for all privately owned utility operators in the state. Thus the regulator lost the ability to link tariff changes to economic performance and found it increasingly difficult to balance subsidy constraints and increase tariffs to protect the financial health of utilities. Consequently, the relationship between the government and the regulator was hampered from the outset (Dubash and Rao 2006).

What each of these Indian examples illustrates is that unless the regulator has won broad legitimacy with competing interests, it cannot provide an alternative space for resolution of conflicts between groups. While regulatory reform has occurred in the Indian context, resulting in promising changes – such as the availability of procedural safeguards that promote transparency and public debate – interactions between stakeholders in the system are still shaped by the political context. In both states, there was no independent regulator and reforms were primarily driven by the government. One of the outcomes of the reform process was the establishment of an independent electricity regulator. Once the government had established the initial framework, it tried to take a step back. In Andhra Pradesh, it largely succeeded by driving internal management reforms that put the regulator in a position of never having to make difficult and politically sensitive decisions (Dubash and Rao 2006). In Delhi, the projected benefits of privatization simply did not take place. Services did not improve, and the regulator had limited ability to rectify the situation, further eroding its credibility as truly independent (Dubash and Rao 2006).

THE CREDIBILITY AND INDEPENDENCE OF A REGULATOR SHOULD BE A CENTRAL GOAL DURING ITS CREATION, SUPPORTED BY ROBUST SELCTION AND STAFFING POLICIES AND UTILIZATION OF EXTERNAL EXPERTS

The credibility and independence of a regulator from the outset is a key determinant of regulatory strength. This can be boosted by robust selection and staffing policies. Without independence, regulatory and even industry capture may occur, as illustrated by the cases mentioned below. Again, the Indian context provides examples of contrasting practice. In Andhra Pradesh, external experts played a significant role in setting up the regulatory organization. Consultants acted as important change agents by defining the intellectual approach and agenda and designing relevant implementation models. Over time, the staff of the regulator internalized the economics and intricacies of the model and could implement it effectively alone. Consultants also helped boost cooperation across government departments and brought an apolitical influence without any historical association with any particular department. Utilizing external experts facili-

tated the diffusion of technical and managerial expertise to the permanent staff of the regulator, who learned skills and techniques through association and interaction (Dubash and Rao 2006).

Neutral external experts also act as a bulwark against forces that erode the independence of the regulator. Indian civil servants belong to deep-seated networks and often work through backroom networks and consultations, which does not facilitate transparency (Dubash and Rao 2006). The presence of prior government employees curtails the space for the emergence of a new and distinct regulatory structure. Another source of recruitment in many regulatory bodies has been the technical fraternity of India's publicly owned electric utilities (Dubash and Rao 2006). This, however, impinges on the independence and image of the regulator since erstwhile employees of a regulator bring insider knowledge and have personal ties with the regulated company.

Further, a long history of working in a bundled setup without an independent regulator does not facilitate the learning of best regulatory practices or an understanding of new trends in competition and markets. The regulator's human resources procedures are typically also based on existing government pay scales and promotion criteria, which makes it more difficult to recruit capable staff from the private sector (Dubash and Rao 2006). There are examples of states attempting to overcome these trends: Andhra Pradesh has tried to work around this problem by hiring academic experts for senior and important positions like Director of Tariffs (Dubash and Rao 2006).

BOARD COMPOSITION AND STRUCTURE SHOULD FACILITATE TRANSPARENT, CALCULATED, AN SUSTAINABLE DECISION-MAKING PROCEDURES

With regard to decision-making structures, there may be two potential options that can be employed. Regulators can be led by a single Director who makes most decisions, such as the Director-General positions formerly seen in the UK. Single member commissions or Directors are susceptible to "idiosyncratic behavior," as observed in the actions of the sole regulator for the Indian state of Delhi. This gentleman reduced the auditing role of the regulator and halted attempts at pro-active scrutiny. In one case of outright fraud committed by a private utility operator, no action was taken (Dubash and Rao 2006).

An alternative to this single point of accountability model is to structure agencies with a commission of members who are responsible for making high-level decisions. Commissions can be flexible in size, such as in Ireland, where legislation provides for the ministerial appointment of an electricity regulatory body between one and three persons (Tremolet and Shah 2005). A commission structure may be preferable as it enables the airing of multiple perspectives. Some have recommended an ideal commission size of three to seven members for a developing country, as this will provide benefits of a commission structure while also not burdening the legislature or executive with cumbersome human resources requirements in selecting commission members (Tremolet and Shah 2005). Both the Electricity Regulatory Commission of Mongolia and the Armenian Public Services Regulatory Commission have five commissioners including the Chairman (Energy Regulators Regional Association 2013;

Mongolia: European Bank for Reconstruction and Development 2014).

Commissions may also have a mix of full-time and part-time members, but care should be taken that part-time commissioners do not have a conflict of interest due to other ties and responsibilities. A significant majority of regulators with commission-based structures are legally specified, and most commissions make decisions based on majority voting, with the President of the Commission casting a decisive tiebreaker vote when required (Tremolet and Shah 2005). In Mongolia, the Electricity Regulatory Commission has three permanent members (a Chairman and two commissioners) while the remaining two commissioners are appointed on a part-time basis (Energy Regulators Regional Association 2013b).

THERE SHOULD BE SAFEGUARDS FOR FUNDING SOURCES AND BUDGETARY CONTROL INDEPENDENT OF THE GOVERNMENT

A critical issue that governs the independent functioning of a regulator is its financial health. Funding must be adequate and reliable for a regulator to operate effectively and to be free from external influences and pressures. Commonly used funding sources are direct transfers from governments or national exchequers, fees or levies imposed on the regulated industry, or tariffs and taxes levied on the consumption of a particular good or commodity.

Typically, governments fund regulators during the initial stage of formation. For example, both the Russian Federal Tariff Service and the Agency of the Republic of Kazakhstan on Regulation of Natural Monopolies are fully funded from their respective national budgets (Energy Regulators Regional Association 2013a; Energy Regulators Regional Association 2013c). However, reliance on government funds can impact political and administrative independence of the regulator. Many regulatory institutions prefer to move away from government sources after putting institutional structures and functions in place. For example, electricity and energy regulatory bodies in Gambia and Trinidad and Tobago transitioned to levying fees on users or firms (Tremolet and Shah 2005). Nepal raises 25 percent of its funds from the regulated industry, while 47 percent is raised by Canada and Rwanda (Tremolet and Shah 2005). The Mongolian Energy Regulatory Commission finances itself completely from fees collected from license holders, while the Armenian Public Services Regulatory Commission's budget is paid for through compulsory fees levied on regulated entities (Energy Regulators Regional Association 2013b; European Bank for Reconstruction and Development 2014). Some choose to operate with combinations of different funding sources. The Energy Commission of Ghana places separate levies on consumers and the regulated industry, as well as receiving some funding from the government. This strengthens the regulator by decreasing reliance on any one particular source of funding and reduces variations in annual budgets that may arise due to temporary financial shocks (Tremolet and Shah 2005).

One area where the government's involvement may be required is in the approval of the regulator's budget. This may be done by the executive (such as for the Public Utilities in the Bahamas and the water regulator in England and Wales), or the legislative branch (such as the Regulatory Commission for Energy in Mexico and the Energy Regulatory Office in Poland)

(Tremolet and Shah 2005). In either case, the process must be timely to ensure funding is available on time for critical functions and initiatives.

Cumbersome and unwieldy processes – like those of the energy regulatory commissions of Ghana and Bulgaria – can lead to the delayed availability of resources or reduced funds. In Ghana, the Energy Commission's annual budget must first be approved by the Ministry of Finance. It then becomes part of the Finance Minister's overall budget, which must obtain parliamentary approval. Only after these approvals are received can the funds be made available. In Bulgaria, the parliament approves the budget, but due to the amending powers of the Ministry of Finance, there are often reductions to the final budget versus what was originally requested (Tremolet and Shah 2005). There should also be safeguards to ensure that the government cannot divert funds to other departments and thus impair the functioning of the regulator.

In some systems, approval powers rest with the regulatory agency alone, with no need for approval from any higher institution: staff prepare the budget and the Board approves it. This happens in Zambia for the National Water Supply and Sanitation Council (Tremolet and Shah 2005). The advantage of such a process is that it is quick and finalized amounts may be in line with requirements since the process is internally controlled. However, the regulator may need to adhere to higher standards of accountability as there is no external monitor. This can be accomplished through periodic financial reviews, as well as ensuring total transparency through, for example, annual reports detailing activities, income, and expenditures (Tremolet and Shah 2005).

IV. CONCLUSION

Regulation plays a central role in the electricity industry. It helps define a process for integrating new entrants into the market and serves two broad purposes. One is the protection of the public interest through a public organization, positing regulation as a public good. Regulation can also be conceived of as a private good, serving specific public or private sector organizations in the electricity industry, for example through the power market exchange, which defines a set of rules governing interactions in this space (Besant-Jones 2006).

Public regulation provides a broad legal framework that governs transactions and relationships between actors. Public regulation becomes even more important due to certain characteristics of electricity infrastructure. Developing assets requires a large amount of capital, which cannot be redeployed after investment. Investors face a considerable risk of expropriation and expect to be protected to ensure that investment continues in the sector. The "natural monopoly" nature of electricity transmission and distribution contributes to this imperative. Due to inefficiencies in a competitive market structure in this arena, the absence of competition signifies that external and independent regulation is required to protect consumers from exploitation and abuse by large monopolistic firms (Besant-Jones 2006).

Electricity is a critical building block of economic development and independence, and so the strength of the electricity utility sector should be one of the highest priorities on the development roadmap. But – as seen by Of-

gem's ruling to deliver value to consumers in the UK – this creates considerable stress on both the quality of electricity and the price at which it is provided to end-users, particularly within a development context. Effective and independent regulation is pivotal in balancing these priorities (Besant-Jones 2006). The mandate, structure, and function of the electricity regulator are of vital importance in ensuring the continued growth and sustainability of the electricity sector and play a major role in safeguarding economic development.

V. REFERENCES

Baldwin, Robert, Martin Cave, and Martin Lodge. 2012. Understanding regulation: theory, strategy, and practice. Oxford: Oxford University Press.

Besant-Jones, John E. 2006. Reforming Power Markets in Developing Countries: What Have We Learned? Washington, D.C.: The World Bank.

Brown, Ashley C., Jon Stern, Bernard William Tenenbaum, and Defne Gencer. 2006. Handbook for Evaluating Infrastructure Regulatory Systems. Washington, D.C.: The World Bank.

Brunwasser, Matthew and Dan Bilefsky. "After Bulgarian Protests, Prime Minister Resigns." New York Times. Accessed January 14, 2014. http://www.nytimes.com/2013/02/21/world/europe/bulgarian-government-is-reported-set-to-resign.html?_r=1

den Hertog, Johan. 2010. Review of Economic Theories of Regulation. Utrecht: Tjalling C. Koopmans Research Institute.

Dubash, Navroz K., and Narasimha Rao. 2006. "Emergent Regulatory Governance in India: Comparative Case Studies of Electricity Regulation." Paper presented at conference on "Frontiers of Regulation: Assessing Scholarly Debates and Policy Challenges," University of Bath, Bath, UK, September 7-8.

Eberhard Anton. 2006. "Infrastructure Regulation in Developing Countries: An Exploration of Hybrid and Transitional Models." Paper presented at the 3rd Annual Conference of the African Forum of Utilities Regulators, Windhoek, Namibia, March 15-16.

Economist. "Protesting about power prices." Economist. Accessed July 15, 2014. http://www.economist.com/blogs/easternapproaches/2013/02/bulgarias-electricity-prices

Electricity Regulatory Authority of Uganda. 2013. "Electricity Regulatory Authority - Functions of ERA". Accessed July 15, 2014. http://www.era.or.ug/index.php/about-us/2013-10-15-15-57-40/functions-of-era

Energy Regulators Regional Association. 2013a. "Membership Profiles: Kazakhstan." Accessed July 15, 2014. http://www.erranet.org/AboutUs/Members/Profiles/Kazakhstan

Energy Regulators Regional Association. 2013b. "Membership Profiles: Mongolia." Accessed July 15, 2014. http://www.erranet.org/AboutUs/Members/Profiles/Mongolia

Energy Regulators Regional Association. 2013c. "Membership Profiles: Russia." Accessed July 15, 2014. http://www.erranet.org/AboutUs/Members/Profiles/Russia

European Bank for Reconstruction and Development. 2014. "Armenia Country Profile." Accessed July 15. http://www.ebrd.com/downloads/legal/irc/countries/armenia.pdf

Geddes, R. Richard. 1992. "A HistoricalPerspective onElectric Utility Regulation." Regulation, Winter 1992. Accessed July 15, 2014. http://object.cato.org/sites/cato.org/files/serials/files/regulation/1992/1/v15n1-8.pdf.

Horrocks, Sally, and Thomas Lean. 2011. NLS Scoping Study: An Oral History of the Electricity Supply Industry in the UK. London: National Life Stories.

Joskow, Paul L. and Roger G. Noll. 1981. "Regulation in Theory and Practice: An Overview," in Gary Fromm (ed), Studies in Public Regulation, Boston: MIT Press, 1981, 1-65.

Murray, James. 2013. "Ofgem bears down on network costs with help from smart grid investment." BusinessGreen. Accessed January 15, 2014. http://www.businessgreen.com/bg/analysis/2308723/ofgem-bears-down-on-network-costs-with-help-from-smart-grid-investment.

Peltzman, Sam. 1983. "Toward a More General Theory of Regulation." Journal of Law and Economics, vol. 19 (August. 1976), 211-40; and Gary Becker, "A Theory of Competition among Pressure Groups for Political Influence," Quarterly Journal of Economics, vol. 98 (August 1983), 371-400.

Peltzman, Sam. 1989. "The Economic Theory of Regulation after a Decade of Deregulation." Brookings Papers on Economic Activity: Microeconomics, 1989. Accessed July 15, 2014, www.brookings.edu.

Stigler, George J. 1971. "The Theory of Economic Regulation." Bell Journal of Economics and Management Science, vol. 2 (Spring 1971), 3-21.

Regulation Body of Knowledge. 2014. "Theories of Regulation." Accessed July 15, 2014. http://regulationbodyofknowledge.org/general-concepts/theories-of-regulation.

Tremolet, Sophie and Niraj Shah. 2005. "Wanted! Good Regulators for Good Regulation: An Evaluation of Human and Financial Resource Constraints for Utility Regulation." Washington, D.C.: The World Bank, ERM, and Tremolet Consulting.

Valentine, Harry. 2011. "A Historical Perspective of Electric Power Regulation." EnergyBiz. Accessed July 15, 2014, http://www.energybiz.com/article/11/10/historical-perspective-electric-power-regulation.

Warner, Joshua. 2014. "Ofgem Implements Price Controls, Investment Plans for Energy Companies." London South East. Accessed January 15, 2014. http://www.lse.co.uk/AllNews.asp?code=ynj6oz8l&headline=Ofgem_Implements_Price_Controls_Investment_Plans_For_Energy_Companies.

Disentangling Supply and Demand: Swiss Monetary Policy During the Financial Crisis

Uuriintuya Batsaikhan

This paper provides an empirical investigation into the possibility of a credit crunch in Switzerland during and after the financial crisis and the subsequent sovereign debt crisis in the Eurozone from 2007 to 2013. In order to differentiate between credit demand and credit supply I employ a dynamic (dis)equilibrium model. The results suggest that a credit crunch did not occur in Switzerland during the financial crisis or the following Eurozone crisis. My results show that growth in domestic credit slowed at the end of 2010, ending a period of significant credit growth. This is particularly true in the domestic construction sector. From the onset of the financial crisis a steady expansion in domestic credit supply is observed, which I attribute to timely rescue and re-capitalization of banks; the strong and appreciating Swiss franc; and generally sound macroeconomic fundamentals with low unemployment, low inflation, and a skilled labor force among others. It is possible that Switzerland's exceptional performance vis-à-vis its European peers during the crisis period is largely due to, but not limited to, effective and timely policy interventions and monetary policy adjustments of the Swiss National Bank (SNB).

I. INTRODUCTION

The collapse of the US sub-prime mortgage market in 2007 signaled the beginning of what has come to be known as the worst financial crisis since 1929 (Baldwin and Wyplosz 2012). The crisis in the US housing market sent a shockwave through the financial sector culminating in the bankruptcy of Lehman Brothers, the fourth largest investment bank in the US. The fallout from the collapse of Lehman had devastating effects on the national and international economy, with US trade and industrial production falling sharply and world output contracting for the first time since World War II (International Monetary Fund (IMF) 2009). The financial crisis soon spread to Europe and resulted in a large wave of bank rescue operations by European governments starting in 2007, as well as enormous liquidity injections by their central banks. UK mortgage lender Northern Rock was among the first victims of the crisis ending in collapse and nationalization, followed by IKB Deutsche Industriebank in Germany, which re-

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quired a buy-out of close to €3.5 billion from KfW Bankengruppe (Kirchfeld and Buergin 2007). Similarly, BNP Paribas in France closed its three investment funds after a "complete evaporation of liquidity" (BNP Paribas 2009). As of June 2009, EU banks had incurred losses of nearly €290 billion (European Commission, 2009). The most important policy measures to remedy the situation of ailing banks and plummeting economies involved recapitalization of banks and transmission of liquidity to the real economy. From the onset of the crisis, the European Central Bank (ECB) resorted to unconventional monetary policy measures which included: buying up asset-backed securities; loan guarantee schemes for troubled banks; and the provision of low-cost funding for investors, with up to €270 billion funds from the member states and €3.2 trillion[1] for further recapitalization of banks in the EU (European Commission 2009).

In the face of recessionary periods, fears of liquidity freezes that may lead to a credit crunch became a real concern. The definition of credit crunch used in this paper follows Friedman (1991), stating that it constitutes a crisis in bank lending, specifically when the economy incurs a shock that leads to a sudden sharp decline in credit supply and excess in credit demand at the prevailing interest rate.

While there is a significant body of research that focuses on the effects of the financial crisis on the dynamics of credit supply and demand in various EU countries, empirical analysis of the Swiss credit market is still missing. This paper fills the gap in the existing literature by examining whether the financial crisis had a significant impact on the course of domestic lending to enterprises in Switzerland, and whether the crisis led to a possible credit crunch consistent with my stated definition.

Switzerland is a particularly interesting case due, in part, to its small open economy and a large highly interconnected financial sector with two systemically important financial institutions (SIFI), regarded as "too-big-to-fail" banks. Throughout the financial crisis Switzerland encountered its own unique set of challenges both domestically and outside its borders. Despite entering recession in the last quarters of 2008 and experiencing extreme currency appreciation due to the large inflow of foreign capital, fast recovery from the crisis and relatively stable domestic credit conditions make the Swiss case worth the analysis. Switzerland's exceptional performance, as argued in this paper, owes largely to effective and timely sequencing of monetary policy and public support, particularly that of the Swiss National Bank (SNB). In addition and not surprisingly, Switzerland's sound macroeconomic fundamentals built up preceding the crisis period, as discussed in detail in the following sections, played a significant stabilizing role in its smooth recovery. This research aims to contribute to the crisis literature by providing a "good practice" scenario in terms of the role of monetary policy in stabilizing the domestic credit conditions and the overall economic performance during the crisis.

II. LITERATURE REVIEW

There is no agreed upon definition for a "credit crunch" and it is used interchangeably with terms such as credit squeeze, credit crisis,

1 Total approved public intervention measures for EU 27 countries and include capital injections into EU banks, guarantees on bank liabilities, relief of impaired assets, and liquidity and bank funding support (European Commission 2009).

credit slowdown, and credit rationing. The classic definition of credit crunch comes from Bernanke and Lown (1991) where the authors define it as a "significant leftward shift in the supply curve for bank loans, holding constant both the safe real interest rate and the quality of the potential borrowers" (207). Friedman (1991) later issued a comment on Bernanke and Lown's paper, claiming that a leftward shift in the supply of credit resulting from more than usual tight monetary policy ignores the severity of the credit crunch. He points out the fact that credit crunch episodes entail a significant reduction of credit allocated through alternative lending channels, which is contrary to Bernanke and Lown's argument that lending by other institutions expands during credit crunch episodes. In this paper, I adopt Friedman's position, with credit crunch defined as a crisis in bank lending and alternative lending institutions (1991).

Cantor and Wenninger examine earlier postwar credit crunches in the US and conclude that if the supply of credit does not vary directly with changes in the interest rate, then it signals credit rationing and constitutes a subset of credit crunch (1993, 33). Their definition is consistent with short-term credit rationing proposed by Stiglitz and Weiss, defined as a temporary (dis)equilibrium phenomenon triggered by an exogenous shock, that leads to sticky prices and a transitional period, during which rationing of jobs and credit occurs (1981). Credit slowdown, on the other hand, is an outcome of generally lower economic and business activity, resulting from both the demand side (weaker balance sheet of a borrower) and the supply side (changes in the bank balance sheet or changes in regulations and policies) (Cantor and Wenninger 1993).

The literature on past crises points to liquidity shocks and drops in bank capital as the most common transmission mechanisms through which financial crises affect the real economy and the dynamics of credit supply and demand (Brunnermeier 2009; Brunnermeier and Pedersen 2009). Policy responses vary accordingly depending on whether the credit crunch is originating from the supply or the demand side. If a credit crunch is resulting from shocks to the banking sector, then recapitalization of banks and opening additional channels for capital is an effective response. If the crisis is demand driven, then steps involving macroeconomic and fiscal stimulus are needed to restore borrower confidence.

Brzoza-Brzezina and Makarski (2010) examine the effects of a credit crunch on a small open economy and find a significant effect of foreign shocks on the domestic banking sector through the influence on the price of capital. In the case of the Polish economy, they conclude that the spread of the 2008 financial crisis to the banking sector led to a 1.5 percent decline in GDP. After examining 14 eastern and central European economies, which have relatively few ties to the US subprime market, Popov and Udell (2012) find clear evidence of credit tightening in the banking sectors as a result of the decline in bank equity and capital at the onset of the financial crisis. The impact of the crisis has been particularly pronounced in advanced economies in Asia, with Hong Kong and Singapore proving highly vulnerable due to its substantial interconnected financial sector and large financial institutions (IMF 2009). However, according to Fratzscher (2012), effects of the crisis on capital flows have been highly heterogeneous across countries and dependent on the quality of institutions, country risks, and macroeconomic fun-

damentals such as GDP, industrial production, trade and budget balance, unemployment rate, and public debt.

When analyzing credit market dynamics, difficulty arises in distinguishing between credit demand and credit supply since the data only show the volume of actual credit allocated to enterprises. The most commonly used model is the (dis)equilibrium model of credit supply and credit demand. It entails an econometric analysis of time series data to try to disentangle the volume of credit demand from supply to determine possible periods of excess credit demand. A (dis)equilibrium model using maximum likelihood estimation (MLE)[2] was first suggested by Fair and Kelejian (1974) and Maddala and Nelson (1974). Maddala and Nelson (1974) estimate credit supply and credit demand separately and state that the minimum of the two determines actual lending. Taking the actual lending as parameters of the distribution, the authors estimate the parametric values of the estimates that maximize the probability of the observed data using MLE. After deriving the estimates and constructing models for supply and demand, the authors determine the probability with which each observation belongs to the supply or the demand regime. Therefore, any prolonged decline in credit supply and excess in credit demand at the prevailing interest rate indicate periods of credit crunch.

In order to disentangle credit supply from credit demand, macroeconomic and financial variables need to be carefully chosen. Determinants of both have been studied extensively in the literature; my final selection constitutes the result of running a number of possible combinations to arrive at the best possible fit.

Baek (2002) uses the (dis)equilibrium model of Maddala and Nelson (1974) to determine periods of credit crunch in South Korea from 1992 to 2001. On the supply side the variables he uses are lagged loans, the difference between the loan rate and the yield on corporate bonds, total deposits, the required ratio of reserves, and industrial production. On the demand side he opts for lagged loans, the difference between loan rate and yield on corporate deposits, and industrial production of previous quarters. He finds that periods of credit crunch occurred after 1995 and were caused by delayed economic reforms. As such, Baek proposes that the appropriate policy action is to clear the uncertainty by decreasing the credit risk of firms rather than forcing credit expansion on commercial banks (Baek 2002).

Čeh, Dumičić, and Krznar (2011) of the Croatian National Bank look for evidence of a credit crunch in Croatia using quarterly data from 2000 to 2011. They find that there was a credit crunch from 2008 to 2009. Interestingly, they argue that the credit crunch was caused by a surge in demand for loans rather than a shortage in the supply of credit. The authors claim that banks became increasingly risk averse and undercapitalized at the same time as the inflow of foreign capital halted due to the effects of the financial crisis. High demand was caused by earlier credit expansion and increased exposure of the domestic market to foreign capital. However, demand fell in 2009, which was followed by a period of recession. The authors identified multiple determinants of credit demand, including the nominal interest rate,

2 Given particular parameters of the data, MLE provides estimates of the parameters that maximize the likelihood function, i.e., it provides estimates that make the observed parameters most probable.

GDP and the output gap, Emerging Markets Bond Index (EMBI)[3] yield spread, and the Euro Interbank Offered Rate (Euribor)[4]. Credit supply variables include the lending capacity of the banks, GDP, the difference between lending rate and deposit rate, the volume of non-performing loans, loan-loss provision expenses, return on assets (ROA), return on equity (ROE)[5], and Euribor. They conclude that the determinants of both credit supply and credit demand depend on the external economic and financial environment. Therefore, strengthening export demand emerges as the key policy action.

Schmidt and Zwick (2012) use Ordinary Least Squares (OLS), a static (dis)equilibrium model with MLE, and a dynamic (dis)equilibrium model with both MLE and Bayesian inference methods to investigate if there was a credit crunch in Germany during the financial crisis of 2008-2009. The authors use lagged loans, lagged industrial production, and lagged industrial bonds as determinants of credit demand and lagged loans, and lending capacity (annual change), interest rate spread, and share prices as determinants of credit supply. They find that there was no credit crunch in Germany during the financial crisis largely due to policy support and central bank efforts to increase the liquidity base of banks.

III. DYMANICS OF SUPPLY AND DEMAND IN THE SWISS CREDIT MARKET

The Swiss economy is characterized by a large banking sector with 4.36 trillion Swiss francs (CHF) worth of assets, which is eight times the annual GDP and represents the highest bank asset to GDP ratio in the G10[6] countries as of 2009 (Swiss National Bank (SNB) 2009). The banking sector is dominated by two banks, UBS and Credit Suisse, which supply over 34 percent of all domestic loans, followed by Cantonal banks with 32 percent (SNB 2009). There was a significant cause for alarm from the onset of the crisis since the two big banks, particularly UBS, had made substantial investments in the US housing market. UBS reported losses of 53.1 billion USD and Credit Suisse 17.1 billion USD (SNB 2010). Contrary to the SIFIs, the regional, cooperative (Raiffeisen), and cantonal banks that focused on domestic lending experienced little to no impact of the crisis. According to SNB, domestically focused banks have built up large reserves before the financial crisis with excess capital of 3.5 to 5 percent in relation to their balance sheet (SNB 2009, 38). In October 2008, as a response to the deteriorating situation at UBS and Credit Suisse, the Swiss National Bank, the Swiss Government, and the Swiss Financial Market Supervisory Authority (FINMA) put forward a rescue package worth 60 billion USD for UBS and increased the capital base of Credit Suisse. To maintain a steady supply of credit, SNB further lowered the target rate of Swiss

3 EMBI is an index developed by JPMorgan to track the return on bonds/foreign currency denominated external debts in emerging market economies and consists of a set of three indices: EMBI+, EMBI Global, EMBI Global Diversified.

4 Euribor is a daily interbank interest rate at which Eurozone banks lend funds to each other.

5 ROA and ROE measure the profitability of the financial institution and its efficiency at turning profits for its stockholders.

6 G10 countries jointly participate in the General Agreement to Borrow (GAB) where governments and central banks of these countries grant access to IMF to borrow funds in certain circumstances. G10 countries include Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, UK, and US. Switzerland joined in 1964, becoming the eleventh member; however the name has not been modified.

franc Libor to between 0 and 0.75 percent as of March 2009, offered repo operations at longer maturities, and purchased Swiss corporate bonds and large amounts of foreign currency to slow down the overvaluation of the Swiss franc (SNB 2009). Fearing a drop in demand, two fiscal stimulus packages were put forward in November 2008 and February 2009 (SNB 2009).

Before the introduction of the first stimulus package, SNB's balance sheet increased nearly twofold from 2007 to 2008 and continued to expand well after the crisis, hitting almost 80 percent of GDP in 2012 (see Appendix Figure 3). In addition, the safe haven[7] effect created downward pressure on consumer prices and a sharp appreciation of the franc, which on the one hand led to increased domestic consumption and, coupled with low interest rates, to strong domestic demand. On the other hand, if such a trend was to continue it would in the medium- to long-term have decreased the international competitiveness of the franc, hurt export industries, and potentially led the housing market to overheat.

In order to relieve pressure from the franc, SNB began purchasing large amounts of foreign currency starting in 2009 through 2010 (SNB 2012). The drastic measure was taken in September 2011 when SNB set a minimum exchange rate of 1.20 CHF against the euro as a response to further appreciation of the Swiss franc. The chairman of the Governing Board of the SNB, Thomas Jordan, stated that SNB was prepared to enforce this minimum rate through unlimited foreign currency purchases, where necessary (SNB 2012). Alongside the measures to weaken the Swiss franc, SNB began taking active steps to reduce the risks in the real estate and mortgage markets, including restrictions on the type of collateral used for mortgage loans, a permanent adjustment to risk-weight of commercial bank loans,[8] and macro-prudential instruments in the form of a counter-cyclical capital buffer (SNB 2012). In the meantime, the debt crisis in the Eurozone continued to persist throughout 2012, pushing investors to flee from crisis-hit domestic markets to the stability of the Swiss economy. The currency floor created a temporary stop to the euro's free-fall against the Swiss franc and provided an extent of certainty for the export industries in the short term (Simon and Hausner 2012). However, costs associated with maintaining a currency peg are extremely high and unsustainable in the long run, not only for SNB, which holds a large amount of euros while the crisis in the Eurozone continues to deepen, but also for the Swiss economy as a whole with export losing profit and domestic producers losing competitiveness against imports. As such, after almost three years of maintaining the minimum exchange rate, SNB abandoned the peg in January 2015, which led to the franc to surge by almost 39 percent against the euro (*Financial Times* 2015).

Despite these efforts, Switzerland did enter a recession, with its GDP contracting in the third quarter of 2008 (see Appendix Figure 1). Furthermore, the number of registered small and medium sized enterprise (SME) bankrupt-

7 In an environment of increased risk-aversion and high uncertainty as it happened during the financial crisis and crisis in the Eurozone, investors flee risky assets and turn towards safer investments, even if it means low profitability. As such, demand for Swiss franc and franc denominated assets rose substantially during the crisis period leading to extreme appreciation of the currency.

8 For instance, by replacing riskier loans (higher weight) with safer ones, such as government bonds (Cohen 2013 27).

cies and insolvencies increased from 4,315 in 2007 to 6,255 in 2010 (Organization for Economic Cooperation and Development (OECD) 2012). According to SNB data, the profitability of Swiss banks in this period shrank by 11.16 percent in 2008 and by 13.60 percent in 2009.

In terms of the course of domestic lending, monthly loan utilization data provided by SNB suggest that there was a steady growth in loans to enterprises until the beginning of the financial crisis and a strong, steady growth during the crisis, followed by a small decline in 2010 (Figure 1). However, it can also be observed that credit growth was characterized by high volatility throughout the financial crisis and the crisis in the Eurozone (Figure 2).

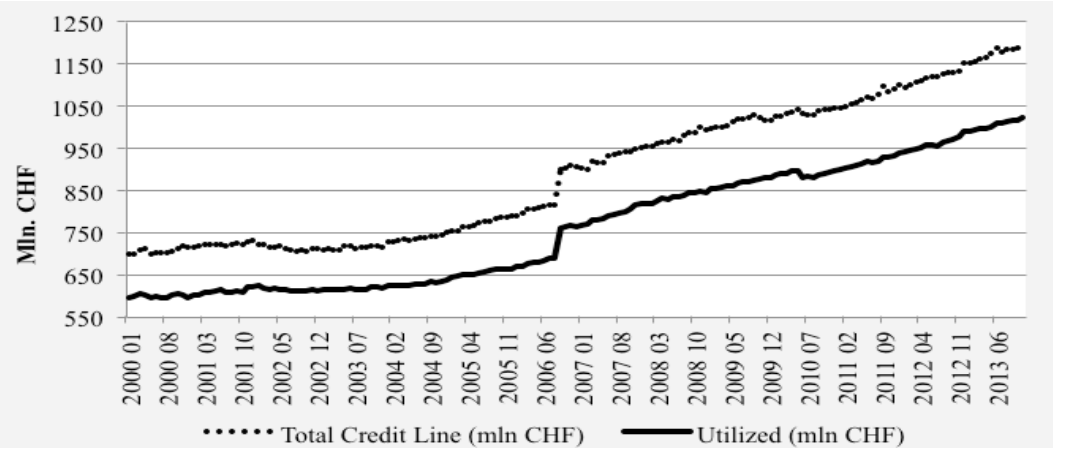
This suggests that fears regarding a possible credit crunch due to deflationary pressures, weak export demand from trading partners and an associated drop in domestic output, and concerns regarding the loss of bank profitability and capitalization were justified. In addition, the safe haven effect resulting from international capital inflow led to extreme appreciation of the Swiss franc and continued to pose a challenge throughout the financial crisis and the subsequent sovereign debt crisis in the Eurozone.

IV. METHODOLOGY

I employ Maddala and Nelson's (1974) (dis) equilibrium model to determine the actual credit volume by taking the minimum of estimated credit supply and credit demand. Similar to the approach Schmidt and Zwick (2012) use to analyze the German credit market, I use OLS to estimate my model[9]. I implement robustness checks using control variables, test for structural breaks using the Chow test, and

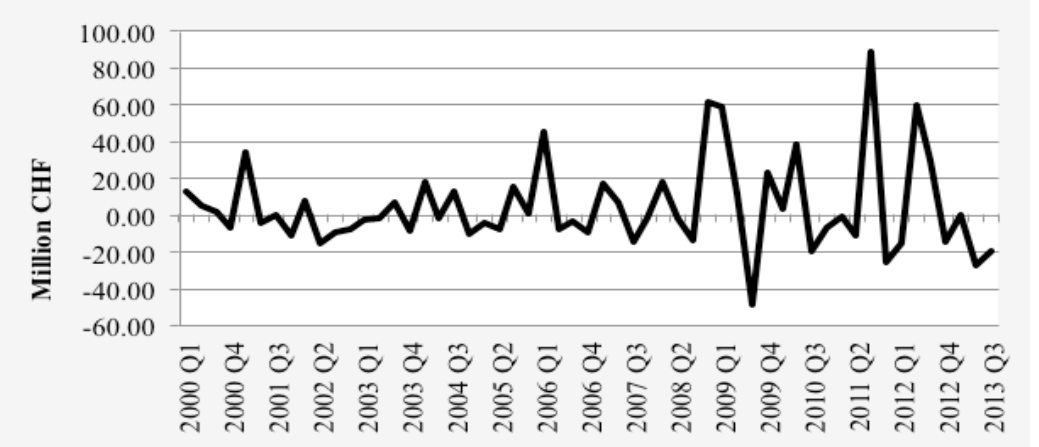
9 While employing MLE approach is consistent and more common in similar studies, due to the lack of familiarity with the approach I employ the OLS method only. However, it should be noted that using MLE approach could have given different results.

Figure 1: Total Loans to Enterprises in Switzerland



Source: Swiss National Bank (SNB)

Figure 2: Quarter-on-quarter Change in Lending in Switzerland for the Observed Banking Groups



Source: Swiss National Bank (SNB)

include the necessary variables to account for breaks in the dataset.

The dependent variable in my analysis is the utilized credit volume[10] from 2000 to 2013 on a monthly basis derived from bank lending statistics of the Swiss National Bank (SNB). In order to reduce bias, I include a range of control variables. Determinants of credit supply and credit demand and the corresponding control variables are mostly taken from Schmidt and Zwick (2012) and Erdogan and Senftleben (2009).

The (dis)equilibrium model includes separate equations for credit supply and credit demand. The rationale is that the market does not clear in each time period. Due to interest rate adjustment, it is always the case that either the demand is higher than supply or that supply is higher than demand. Therefore, the minimum of the two serves as the observed actual credit volume (Maddala and Nelson 1974).

Equations for the credit supply and credit demand:

$$C_t^d = X_{1t}' \beta_1 + \varepsilon_{1t}$$

$$C_t^s = X_{2t}' \beta_2 + \varepsilon_{2t}$$

$$C_t = min\,(C_t^d, C_t^s)$$

Where C_t^d is credit demand; C_t^s is credit supply; X' determinants of demand and supply, β_1 and β_2 are coefficients to be estimated, ε_{1t} and ε_{2t} are errors and assumed to be i.i.d. C_t is the minimum of credit demand and credit supply, which determines the actual credit volume. Schmidt and Zwick (2012) estimate the dynamic version of the (dis)equilibrium model, stating that the past observations of the credit volume influence

10 Includes total credit utilization by cantonal banks (share of domestic credit allocation- 32 percent), big banks (34 percent), regional banks (9 percent), Raiffeisen banks (13 percent), other banks (12 percent) and does not include credit supply by finance companies, branches of foreign banks and private bankers (SNB 2009).

actual credit volume (10). Therefore, authors included lags of the dependent variable. [11]

In order to estimate credit supply and credit demand on the Swiss credit market, I use the following determinants:

$$C_t^s = \beta_0 + \rho_1 C_{t-1} + \beta_1 D_t + \beta_2 Dp_t + \beta_3 \pi_t^e + \varepsilon_{1t}$$

$$C_t^d = \alpha_0 + \rho_2 C_{t-1} + \alpha_1 CLI_t + \alpha_2 SPI_t + \alpha_3 \pi_t^e + \alpha_4 i_t^l + \varepsilon_{2t}$$

The supply equation includes a number of explanatory variables: C_{t-1} represents lagged credit volume; D_t is banks' lending capacity (the more capacity banks have, the more credit they can supply); Dp_t is monthly foreign currency deposits denominated in CHF (the more deposits the banks receive, the more loans they can extend); π_t^e is expected inflation, which also measures general economic risks (higher inflation will result in less supply of credit).

As for the demand equation, C_{t-1} is the lagged credit volume; CLI_t is the Composite Leading Indicator (CLI) accounting for the output gap, which is the difference between actual output and potential output (a positive difference in CLI will result in more demand for credit by firms and is also a good indicator for determining future investment plans); SPI_t is the Swiss Performance Index, a stock market index showing the performance of equity securities of companies registered in Switzerland (higher confidence and positive economic performance would mean an increase in the demand for credit); π_t^e is the expected inflation (credit demand would increase with higher inflation as inflation will erode the value of debt); i_t^l is the lending rate (lower lending rate would mean more demand for credit).

Data on credit utilization (C_t), lending capacity of banks (D_t), and deposit volume (Dp_t) are taken from SNB, expected inflation (π_t^e) from the Swiss Federal Statistical Office, while the Swiss Performance Index (SPI_t) is compiled from monthly reports of the SIX Swiss Stock Exchange. The data on the Composite Leading Indicator (CLI_t) is taken from the OECD database.

Results from the test of stationarity[12] show that all variables are non-stationary. Since all variables are non-stationary, I used a cointegration test for checking non-stationarity in the errors. The results from the cointegration tests on the errors suggest the null that errors in the series are non-stationary can be rejected at the 1 percent level both for supply and demand estimations. [13]

As shown in Figure 1, there is a sudden increase in credit between August and September 2006. According to the SNB monthly reports

11 Schmidt and Zwick (2012) include lag of 4 quarters of industrial production due to the fact that "bank credits lag economic activity quite substantially" (p. 13). Walsh and Wilcox (1995) include 7 months lag of economic indicators when looking for an effect of bank credit on economic activity.

12 Tests if statistical properties of the time series do not change over time. In this paper stationarity is assumed to be the order to two, where the mean, variance, and auto-covariance does not change with time.

13 P-values of 0.000 for both tests.

Table 1: Results of the Test of Stationarity

Variables	Test Statistic	McKinnon approximate p-value for Z(t)
Utilized credit	1,326	0.9967**
Lending capacity of the banks	1,244	0.9963**
Deposit volume	-2,136	0.2303**
Expected inflation	-2,477	0.1212**
Composite Leading Indicator (CLI)	-1,350	0.6059**
Swiss Performance Index (SPI)	-0.236	0.9340**
Lending rate	-0.881	0.7942**

Note: The null hypothesis of a unit root can not be rejected at 1 percent significance based on McKinnon one-sided p-values.

this increase is due to a change in the accounting methods.[14] Therefore, it is necessary to check for structural breaks in the data for both supply and demand equations to determine if each series can be pooled together. I employ the Chow test for the period before and after August to September 2006 and check for a known structural break. In terms of the supply equation, I reject the null ($p<0.02$) of no difference in the estimated coefficients leading to the assumption that the estimations before the structural break and after the break are different. Since I cannot pool the series together, I include a dummy for the break and interaction of the explanatory variables with the break in the supply equation. If the structural break is not accounted for, it could lead to bias in the estimations, general unreliability of the model, and false estimates when forecasting. For the demand equation, however, I do not reject ($p>0.10$) the null of no difference in the estimated coefficients and use it in the original form. [15]

V. RESULTS

The estimation results are included in Table 2. The results of the analysis do not reflect the existence of a credit crunch in Switzerland that is consistent with Friedman's definition of credit crunch as a crisis in bank lending and alternative lending channels. In addition, there are no signs of credit rationing as firms respond fully to interest rate adjustments. The supply equation shows that there is a strong positive association between credit supply and lagged loans ($p<0.001$), as well as the lending capacity of banks ($p<0.001$). The estimated coefficient on the interaction term between the break dummy and lagged loans is negative, which indicates that with the break included in the estimation the association between lagged loans and the credit supply is different. In contrast,

14 Before September 2006 only the big branches of Raiffeisen bank were recorded, afterwards all branches of Raiffeisen bank are included (SNB, March 2007).

15 Given that I reject the null at around 10 percent, I carried out a robustness check by repeating the estimations including the break dummy and the interactions both for supply and demand equations. There were no significant differences in the main results.

inflation has a negligible negative association with credit supply, meaning that an increase in inflation is associated with a lower supply of loans.[16]

Deposit volume is introduced as a control variable in order to assess whether large capital inflows stimulated the supply of credit in Switzerland. If this were to be the case, the behavior of deposit movements could potentially dampen the impact of monetary policy channel. My results show no statistically significant relationship between deposit volume and credit supply. This supports the hypothesis that monetary policy, rather than international capital inflows, played a significant role in providing a stable supply of credit during the financial crisis and the crisis in the Eurozone.

In terms of demand, lagged values of the Composite Leading Indicator (CLI), Swiss Performance Index (SPI), lending rate, and inflation are included. Both the supply and the demand equations include a lag of half a year (two quarters) of inflation. In the demand equation CLI, SPI, and lending rate also include a lag of half a year. Lagged loans and SPI both have a significant and positive association with credit demand. This shows that when firms demand more credit, economic activity tends to grow. Finally, when the lending rate increases, firms tend to demand less credit.

In order to identify possible periods of credit crunch, Figures 3 shows the plot of the difference between estimated credit supply and credit demand against the actual credit volume.

A marked slowdown in demand can be observed, beginning before the financial crisis and continuing through the first half of 2008. During the beginning of the crisis, however, supply kept pace with demand, with temporary excess demand in mid-2010. Excess demand owed to the fact that interest rates were lowered and reached almost 0 percent in 2010, while the Swiss franc experienced continuous appreciation. Sharp appreciation of the franc and an increase of imports in a low interest rate environment might have led to increased demand, particularly from the domestic construction sector (SNB 2010).

According to SNB (2012), banks that focused on the domestic clientele did not experience a significant impact of the crisis and continued to be well capitalized throughout the crisis and in the aftermath (23). Moreover, two big banks, UBS and Credit Suisse, received quick policy support, particularly UBS, with an emergency bailout and recapitalization. As such, banks' lending capacity continues to be positively and significantly associated in the estimation results with credit supply throughout the crisis period.

While these results do not provide evidence of a credit crunch in Switzerland, credit markets were far from functioning smoothly, as can be seen from the difference in credit demand and supply (Figure 3). However, temporary excess demand in mid-2010 constitutes a credit slowdown, rather than a credit crunch. According to Cantor and Wenninger (1993), a credit slowdown can originate from the supply side through either changes in the bank balance

16 With the pooled series inflation does not have an effect on the supply of credit.

Table 2: Results of the Test of Stationarity

	Supply Equation	Demand Equation
Constant	14032.1 (12530)	44304.8 (44529)
Lagged Utilized credit	0.653*** (0.085)	0.985*** (0.008)
Lending capacity of banks	0.280*** (0.064)	
Deposit volume	-0.074 (1.229)	
Expected inflation (-6)	-1763+ (1066)	550.4 (788.13)
Composite Leading Indicator (-6)		-465.1 (452.51)
Swiss Performance Index (-6)		3.241** (1.210)
Lending Rate (-6)		-1843.9* (840.72)
Break	-13515.4 (13893)	
Break*Lagged Utilized Credit	-0.364*** (0.093)	
Break*Lending capacity of the banks	0.329*** (0.072)	
Break*Deposit volume	0.053 (1.229)	
Break*Expected Inflation (-6)	996.6 (1176)	
N	161	161
Adjusted R-squared	0.994	0.997

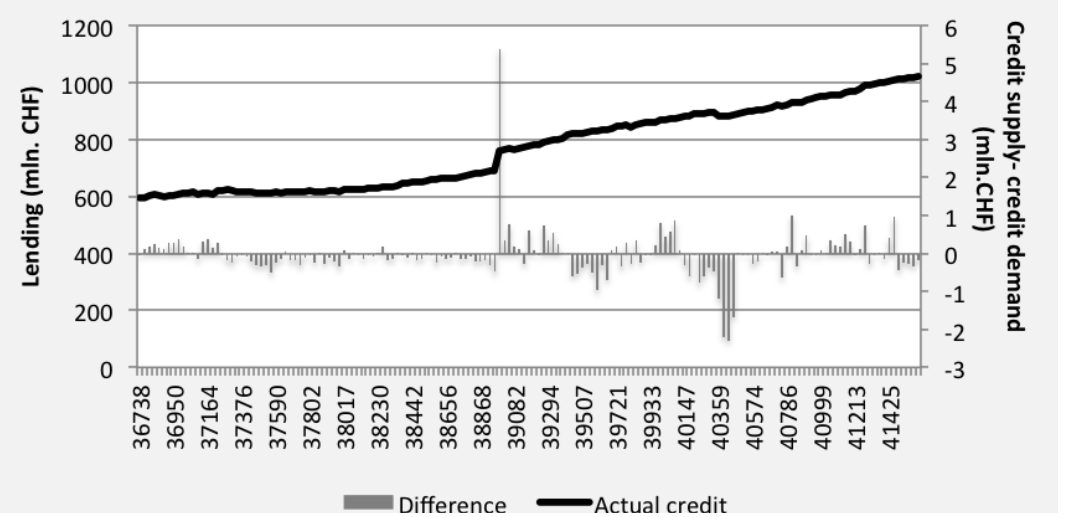
Note: Standard errors in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001; In the supply equation, I included the difference between lending rate and money market rate (Erdogan and Senftleben 2009) to control for banks' moral hazard resulting from asymmetric information between borrowers and lenders (5) and did not discover statistically significant association with the amount of credit supplied; In the demand equation, I included monthly industrial production (Schmidt and Zwick 2012) to account for economic activity instead of the Composite Leading Indicator (CLI) and did not find any significant association. Volume of industrial bonds has been included to account for alternative financing channels other than bank credit financing (Schmidt and Zwick 2012) and did not find any significant association with credit demand.

sheet or regulatory and policy changes. The reason for the credit slowdown in mid-2010 might be attributed to policy changes, such as large amounts of foreign currency purchase by the SNB to relieve the pressure on the franc, as well as changing collateral requirements to prevent overextension of credit and overheating in the domestic construction market.

VI. DISCUSSION

In this paper I explore the possibility of a credit crunch in Switzerland from 2000 to 2013 using a dynamic (dis)equilibrium model similar to the one used by Schmidt and Zwick (2012) in their analysis of the German credit market. In order to determine actual lending, I have used explanatory variables that are commonly

Figure 3: The Difference between Credit Supply and Credit Demand Compared to Actual Lending



included to differentiate between credit supply and credit demand.[17] I have implemented robustness checks using control variables and incorporated dummy variables to account for a known structural break.

The results suggest that during the financial crisis, there were no signs of either credit crunch or credit rationing consistent with the definitions set forth in this study. On the contrary, supply closely followed demand throughout the crisis period with temporary excess demand in 2010. Lending capacity of banks continued to have a significant positive association with credit supply, suggesting that bank capitalization and lending capacity played a crucial role in the steady supply of credit. However, there was a supply-dependent credit slowdown in 2010 after a period of credit growth owing to policy changes to prevent overextension of credit as a response to increased domestic demand and overheating in the domestic housing market. Moreover, there is no association between deposits in the banking sector and the supply of credit. This finding negates the assumption that non-policy induced effects dominated credit supply, namely large international capital inflow deposited in the Swiss banking system. These findings shed some light on the extent of the influence and the speed of monetary policy transmission to the Swiss domestic credit market, particularly regarding the dynamics of credit supply and demand during crisis times.

Switzerland's exceptional performance compared to its European peers therefore seems to owe to a combination of sound macroeconomic and fiscal fundamentals and smart and timely sequencing of monetary policy and government support, particularly on the side of the Swiss National Bank. Crucial policy responses included, but are not limited to: early bailout and recapitalization of its two big banks; lowering of the interest rate to almost 0 percent at the onset of the crisis to stimulate

17 Schmidt and Zwick (2012), Erdogan and Senftleben (2009), and Čeh, Dumičić and Krznar (2011)

demand and fill-in the credit gap; and setting up an exchange rate floor, thereby helping to contain deflationary shocks and create a level of certainty for export industries.

When compared to its neighbors in the Eurozone, Switzerland continued to benefit from a firm fiscal standing during the financial crisis and the subsequent sovereign debt crisis in the Eurozone. These advantages entailed a flexible labor market, low unemployment, balanced budget, and positive trade balance, all of which might have contributed to weathering the crisis with fewer losses. This compares to Eurozone countries that experienced painful fiscal austerity measures to cut government spending, which led to rising unemployment and plummeting public health. In addition, it is worth noting that considering Eurozone countries' limited authority over monetary policy, they pursued active fiscal policy measures and instruments to overcome the crisis. While in Switzerland, monetary policy played a much more prominent role in stimulating the domestic economy and encouraging credit supply and demand.

Much can be learned from the Swiss case, particularly in terms of the speed and effectiveness of policy responses. My analysis suggests that rapid policy interventions in the form of early bank bailouts and monetary policy interventions of SNB to stabilize the franc might have had significant role in creating a faster and less volatile recovery. In particular, SNB's monetary stimulus and the accompanying decrease in interest rates—which included bank bailouts and recapitalizations—might have helped to "fill-in" the credit gap and the findings suggest a significant association between credit demand and the lending rate.

In addition, I find no supporting evidence to the possible argument that Switzerland's "lucky" position as a safe haven for international investors and associated inflow of foreign capital as deposits in its banking system might have contributed to the steady supply of credit. The results of the analysis show no significant relationship between deposits in the banking sector and credit supply, which suggests that domestic credit supply was not driven by outside factors such as an influx of foreign capital. On the contrary, the safe haven effect proved to be something of a double-edged sword. It may have led to increased domestic demand through the appreciation of the currency. On the other hand, however, it is likely to have lowered the competitiveness of export industries and contributed to overheating in the housing market.

While my results suggest that a credit crunch did not occur in Switzerland during the financial crisis or the following Eurozone crisis, there are a number of limitations to my analysis, which should be addressed by further research. First, the study employs only the OLS method to run the (dis)equilibrium model. A study relying only on OLS to estimate credit market (dis)equilibrium in Switzerland might not fully reveal additional relevant information regarding the Swiss credit market. While associated robustness checks have been implemented and results interpreted accordingly, further research should include other estimation methods, such as the dynamic and static version of Maximum Likelihood Estimation and Bayesian methods. Second, in choosing the dependent variable, the study focuses on the aggregate utilized credit of the whole banking

sector.[18] A separate analysis of the each banking group (Cantonal, regional, Raiffeisen, big banks, and other banks) should be implemented, in order to reveal more information on the impact of the financial crisis on the domestic credit supply of each banking group, particularly in the case of SIFIs. In addition, further research that builds upon this paper but focuses on credit conditions after Switzerland abandoned the currency peg in January 2015 could reveal important insights into the domestic dynamics of credit supply and credit demand and the channels through which monetary policy affects credit supply and credit demand in Switzerland.

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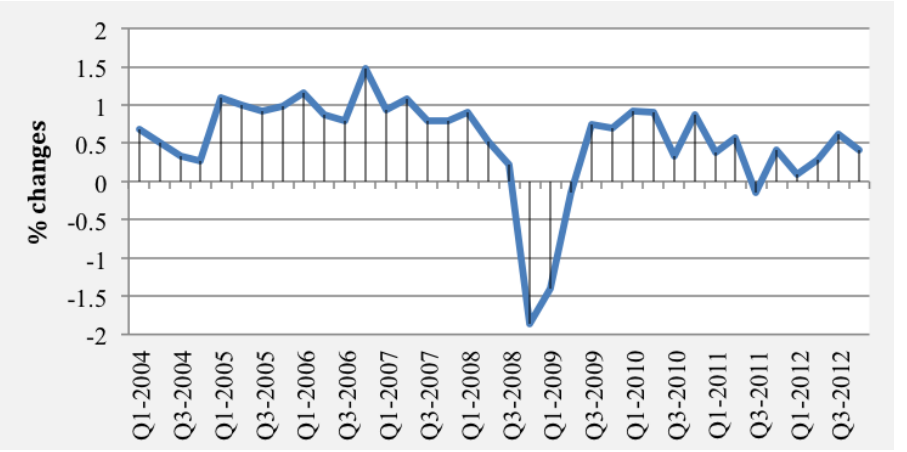
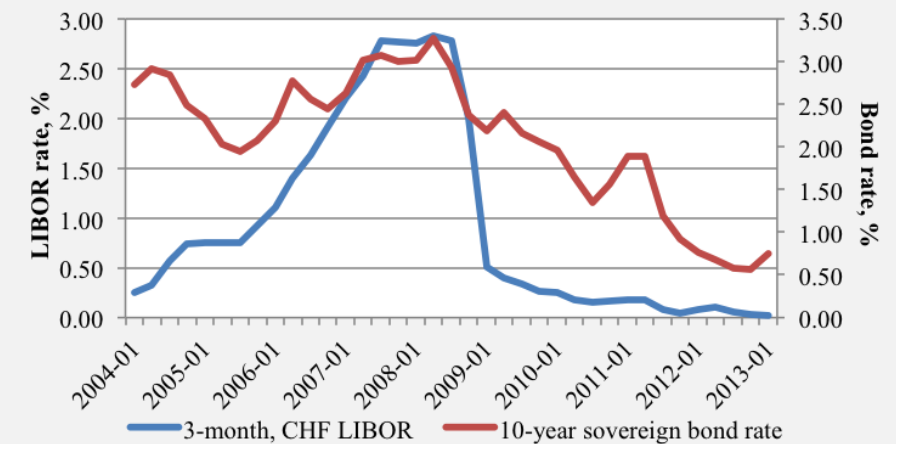
18 Does not include credit supply by finance companies, branches of foreign banks and private bankers (SNB 2009).

VII. APPENDIX

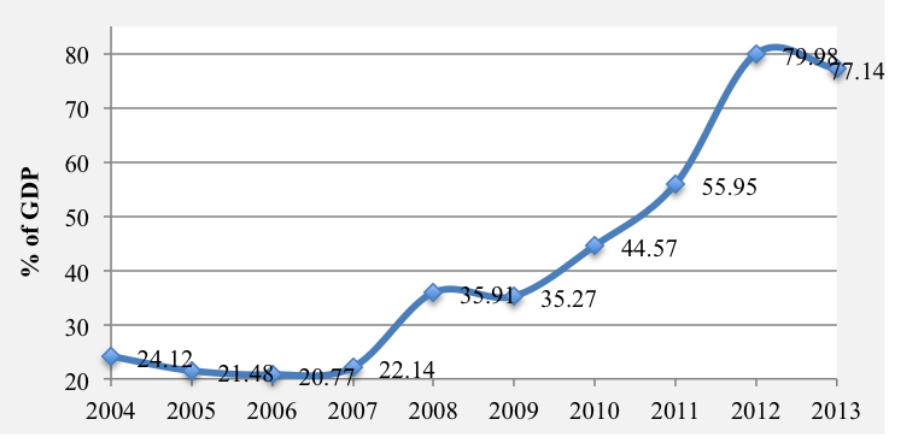
Appendix Figure 1. Swiss GDP, Quarter-on-quarter Changes



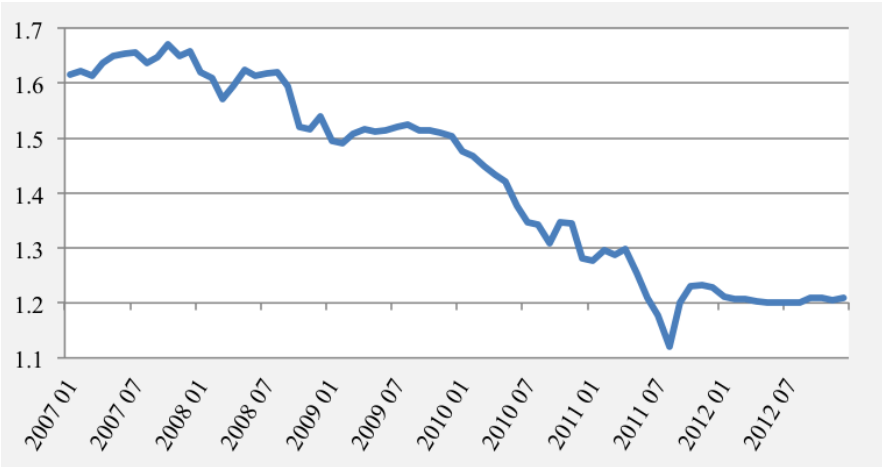
Appendix Figure 2. Interest Rates, Percent



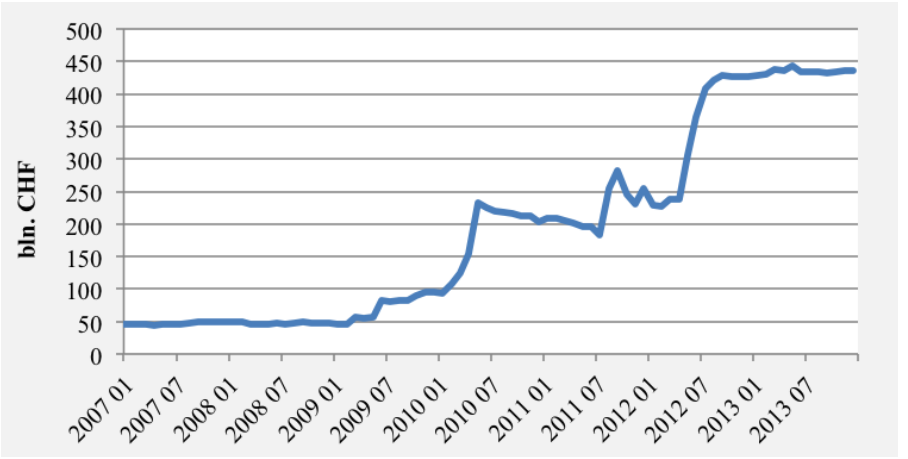
Appendix Figure 3: SNB's Balance Sheet as Percentage of GDP



Appendix Figure 4: EUR/CHF Exchange Rate



Appendix Figure 5: SNB Foreign Currency Reserves



VII. REFERENCES

Baek, Ehung. "A Disequilibrium Model of the Korean Credit Crunch." *ICSEAD Working Paper Series 22*, (2002): 1-26.

Baldwin, Richard, and Charles Wyplosz. "The Economics of European Integration." (2009).

Bernanke, Ben and Cara Lown. "The Credit Crunch." *Brookings Papers on Economic Activity 2*, (1991): 205-248.

BNP Paribas, 2009. http://www.bnpparibas.com/en/news/press-release/bnp-paribas-investment-partners-temporaly-suspends-calculation-net-asset-value-fo

Brunnermeier, Markus K. *Deciphering the liquidity and credit crunch 2007-08.* Journal of Economic Perspectives, 23(1): 77–100.

Brunnermeier, Markus K., and Lasse Heje Pedersen. "Market liquidity and funding liquidity." *Review of Financial studies 22*, no. 6 (2009): 2201-2238.

Brzoza-Brzezina, Michał, and Krzysztof Makarski. "Credit crunch in a small open economy." *Journal of International Money and Finance* 30, no. 7 (2011): 1406-1428.

Cantor, Richard and John Wenninger. "Perspective on the Credit Slowdown." *Federal Bank of New York Quarterly Review*, (1992): 3-34.

Čeh, Ana Maria, Mirna Dumičić and Ivo Krznar. "A Credit Market Disequilibrium Model and Periods of Credit Crunch." *Croatian National Bank Working Papers 28*, (2011): 1-17.

Cohen, Benjamin. "How have banks adjusted to higher capital requirements?". *BIS Quarterly Review*, (2013): 25-41.

Erdogan, Burcu and Charlotte Senftleben. "Credit Crunch in Germany, Novelty or Reality?" *DIW Discussion Papers*, (2009): 1-13.

European Commission. *Economic Forecast Spring 2009*. Luxembourg: EC, 2009

Fair, Ray and Harry Kelejian. "Methods of Estimation for Markets in Disequilibrium: A Further Study." *Econometrica 42*, no.1 (1972): 177-190

Fratzscher, Marcel. "Capital flows, push versus pull factors and the global financial crisis." *Journal of International Economics 88*, no. 2 (2012): 341-356.

Friedman, Benjamin."The Credit Crunch. Commens and Discussions." *Brookings Papers on Economic Activity*, (1991): 240-247.

Giles, Warren. UBS Gets $59.2 *Billion Bailout; Credit Suisse Raises Capital*. Last modified January 10, 2015, from Bloomberg: http://www.bloomberg.com/apps/news?pid=newsarchive&sid=ah0AFa2SEHhw

International Monetary Fund (IMF). *Switzerland*. Staff Report for the 2013 Article IV Consultation. Washington: IMF, 2013

IMF. *World Economic Outlook Crisis and Recovery.* April 2009. Washington: IMF, 2009

Kirchfeld, Aaron and Rainer Buergin. *German Banks Offer to Help Bail Out Subprime-Hit Lender IKB*. Last modified January 10, 2015, from Bloomberg:http://www.bloomberg.com/apps/news?pid=newsarchive&sid=a74CzXMOWmb4

Maddala, Gangadharrao and Forrest Nelson. "Maximum Likelihood Methods for Models of Markets in Disequilibrium." *Econometrica 42*, no.6 (1974): 1013-1030.

Organization for Economic Cooperation and Development (OECD). *Economic Surveys: Switzerland.* Paris: OECD, 2013.

OECD. *Financing SMEs and Entrepreneurs*. Paris: OECD, 2012.

Popov, Alexander, and Gregory F. Udell. "Cross-border banking, credit access, and the financial crisis." *Journal of International Economics 87*, no. 1 (2012): 147-161.

Schmidt, Torsten and Lena Zwick. "In Search of a Credit Crunch in Germany." *Ruhr Economic Papers 361*, (2012): 4-26.

Shotter, James, Alice Ross and Michael Hunter. Swiss stun markets and scrap franc ceiling. Last modified February 15, 2015, from Financial Times: http://www.ft.com/intl/cms/s/0/3b4f6c14-9c9a-11e4-971b-00144feabdc0.html#slide0

Simon, Silvia, and Karl Heinz Hausner. "The impact of the euro crisis on Switzerland." *Intereconomics* 47, no. 2 (2012): 112-119.

Swiss National Bank (SNB). Monthly report for March 2007. Zurich/Bern: Swiss National Bank, 2007.

SNB. Financial Stability Report. Zurich/Bern: Swiss National Bank, 2009.

SNB. Financial Stability Report. Zurich/Bern: Swiss National Bank, 2010.

SNB. Financial Stability Report. Zurich/Bern: Swiss National Bank, 2011.

SNB, 2011. Press Release. Last modified March 9, 2015, from SNB: http://www.snb.ch/en/mmr/reference/pre_20110803/source/pre_20110803.en.pdf

SNB, 2011. Press Release. Last modified March 9, 2015, from SNB: http://www.snb.ch/en/mmr/reference/pre_20110817/source/pre_20110817.en.pdf

SNB, 2015. Press Release. Last modified March 9, 2015, from SNB: http://www.snb.ch/en/mmr/reference/pre_20150115/source/pre_20150115.en.pdf

SNB. *Monetary policy in the financial crisis – measures, effects, risks*. Zurich/Bern: Swiss National Bank, 2012.

Stiglitz, Joseph and Andrew Weiss. "Credit Rationing in Markets with Imperfect Information." *American Economic Review 71*, no.3 (1981): 393-410.

Walsh, Carl and James Wilcox. "Bank Credit and Economic Activity." *Federal Reserve Bank of Boston 39*, (1995): 83-125.

Interview: Massive Data Institute Postdoctoral Fellow Dr. Gaurav Sood on the Challenges and Opportunities of "Massive Data"

Jamie Obal and Austin Williams

From The New York Times *and* The Economist *to Facebook, Twitter, and Reddit, the options for downloading and digesting news and information are endless in today's digital world. Technology is rapidly developing and being used in ways never previously imagined. Most significantly, technological progress has helped to address some of society's most pressing problems—finding new cures, building safer cities, and expanding economic opportunity. However, the pace at which technology, and the associated expansion of data collection, is moving has sparked a heated debate about how government should strike a balance between enforcing regulation, incentivizing competition, and protecting consumer privacy. For scholars dedicated to producing impactful policy research, the rise of big data marks a significant opportunity—and responsibility. Gaurav Sood joined the new Massive Data Institute (MDI) at the McCourt School of Public Policy in September 2014 as its first postdoctoral fellow. At the MDI, Sood plans to focus on estimating ideological positions of media sources by using a novel dataset of more than seven million news articles and television news transcripts. Sood is also exploring the effects of liberalizing regulations on broadband media. He recently spoke to the Georgetown Public Policy Review about his plans at the MDI, his perspective on the development of regulation within this field, his recently completed unpublished work on broadband Internet, and the growing influence of news media on public opinion.*

As the first postdoctoral fellow of the Massive Data Institute (MDI) at the McCourt School of Public Policy, Dr. Gaurav Sood stands on the front lines of a significant change in academic research: the rise of big data. If the word "big" sounds vague, that is because it is. It is an imprecise term, just like "massive," which was adopted as a moniker for the Institute. Unfortunately, it is hard to find appropriate language to describe the large datasets that social and political scientists are now using to deliver fresh understandings of society and human behavior. While the meaning of the term "big data" remains unclear, its benefits are clear. Louisville, Kentucky is combatting asthma with data by using GPS trackers in medical inhalers to see where residents experience the greatest difficulty breathing. The New York Police Department is deepening its understanding of where violent crime exists

Jamie Obal and **Austin Williams** interviewed Dr. Gaurav Sood on March 3, 2015. Jamie and Austin are Interview Editors at the Georgetown Public Policy Review and Master of Public Policy students at the McCourt School of Public Policy. Jamie, originally from Los Angeles, California, focuses on economic development and is interested in uplifting communities in urban and metropolitan areas. Austin, originally from McRae, Georgia, is pursuing an MBA at Georgetown as well to further his interest in public private partnerships on community development initiatives.

by crime-mapping aggregate criminal justice data. Amazon is boosting its profits by using customer data to recommend additional products that a customer "may also like." In a similar vein, the MDI is looking to leverage the power of massive data, with the goal of developing major advances in public policy by bringing together scientists like Sood, who can analyze these types of powerful knowledge resources, and policy practitioners from the government and nonprofit sectors, who can design and implement effective solutions.

The evolution from a brick and mortar world to a more digitized one is nowhere more apparent than at the home of the new MDI. "For the past two years, I've given up on reading conventional outlets. I don't spend too much time reading *The Washington Post*, or *The New York Times*. . . I find them to be quite dangerous actually. I am more liable to end up learning about how to spend 24 hours in Marrakech than the contents of Section 702 of FISA." Sood prefers browsing *The Economist* on his laptop instead. Technology has not just changed the way we consume news, but it has also inspired researchers, policymakers, and students to approach old problems with new innovative techniques and data-driven tools. Previously, terms like "scraping data," "cloud-computing," and "bootstrapping" were more likely to be found in a computer science class than a public policy one. However, with the big data revolution and technology blurring the lines between the physical and digital worlds, these technical terms are starting to be more commonplace at public policy schools. Classes such as Sood's "Introduction to Data Science" are ensuring that the next generation of policymakers is up to speed with the skills to collect, manage, and analyze large datasets.

REGULATION OF MASSIVE DATA

When Sood was pursuing an undergraduate degree in Computer Science at Rutgers University in the early 2000s, he rarely encountered studies with sample sizes of more than a few thousand. In the field of psychology, studies were typically published with sample sizes of less than 100. By the time he finished his PhD in communications at Stanford in 2011, however, data usage had exploded. Data has become massive. Indeed, Sood often works with information sets so large that they do not fit on a computer hard drive. Today, researchers often need to store information across a series of servers, a process he referred to as "data gymnastics."

With big data comes big responsibility. The rise of big data has made waves through the private sector where concerns over consumer privacy and exploitative business practices are raising eyebrows. Media providers ranging from Facebook to Direct TV have been scrutinized for leveraging private customer information for commercial gain. According to a 2014 Pew report analyzing public opinion on security and privacy, researchers found that 91 percent of the respondents on the same survey agreed that consumers have "lost control" over how personal information is accessed and utilized (Madden 2014). Yet 55 percent of the same survey participants agreed that they were willing to share personal information in exchange for free online services. Sood is a realist about these abuses. "It is the reality of a capitalist economy. We have ceded some freedom to businesses. Sometimes data analysis in the private sector enhances people's lives, and sometimes the impact is more negative. These are complex issues to debate." Bruce Schneier, a fellow at the Berkman Center for Internet

and Society at Harvard Law School, cautions of the dangers associated with this economic trade off. In a Ted Talk on security, Schneier—dubbed by *The Economist* as a "security guru"—calls security "a feeling and a reality" (Schneier 2010). He notes, "You can feel secure even if you're not, and be secure even if you don't feel it." Many Americans, according to Schneier, respond to the feeling of individual security, but fail to align their feelings with the reality of national security threats. Hackers exist all over the world, sometimes motivated by things other than profit and threatening the physical safety of Americans and the US government. Regardless of the complexities, Sood thinks governments will respond with more regulation around these issues in the future.

In the post-Snowden era that left Americans debating how much privacy they were willing to relinquish in exchange for national security and technological progress, the Obama Administration has strengthened its efforts to create a regulatory framework that protects consumers' privacy. As a follow up to the 2012 Consumer Data Privacy in a Networked World report, the Administration released a discussion draft of the Consumer Privacy Bill of Rights Act of 2015 (White House 2012; White House 2015). The proposed language aims to complement existing regulations by setting guidelines for how companies can collect and use personal data. However, privacy advocates argue that the draft legislation falls short. In a letter addressed to President Obama, a coalition of 14 consumer privacy groups, including the DC-based non-profit Center for Democracy and Technology, criticized the draft legislation "gives companies broad leeway" and should "afford stronger regulatory and enforcement authority to the Federal Trade Commission" (Center for Data and Technology 2015). Congress is also weighing in on the privacy debate. In a Senate Commerce, Science, and Transportation Committee hearing on how the internet has heightened connectivity, Chairman John Thune advised policymakers to "resist the urge to jump head first into regulating this dynamic marketplace," and emphasized Congress' role to "ensure that any government efforts to protect consumers are tailored for actual problems and avoid regulatory overreach" (2015). Ranking Member Bill Nelson characterized the idea of "overregulating" as a "red herring," and urged for "conversation and cooperation between the FTC and the industry" in order to address concerns of consumer privacy and network security.

The Federal Trade Commission (FTC), the US federal agency tasked with protecting consumers and promoting competition, recognizes the privacy challenges involved with harnessing the power of big data. The FTC recently created the Office of Technology Research and Investigation, which will conduct investigative research on emerging technology issues including privacy, data security, connected cars equipped with internet access, smart homes, algorithmic transparency, emerging payment methods, big data, and the Internet of Things—the vast physical network of technology that enables devices to be connected to the internet. With technology moving at lightning speed and plugging in to almost every aspect of our daily lives, legal institutions like the FTC are encouraged to collaborate across sectors. In a keynote address at a Georgetown University forum entitled "Privacy Principles in the Era of Massive Data," Federal Trade Commissioner Maureen Ohlhausen called for "a coalition of academics, regulators, businesses, and con-

sumers" to tackle privacy concerns surrounding big data. Among the growing concerns for regulators is how big data can become a tool of exclusion. For example, algorithms can use an individual's neighborhood to generate different discounts for the same product and eligibility scores for housing or employment. Low income and underserved communities are particularly susceptible to this "digital redlining," and the 2014 White House Big Data Report warns that the "increasing use of algorithms to make eligibility decisions must be carefully monitored for potential discriminatory outcomes for disadvantaged groups, even absent discriminatory intent." Just as redlining in the financial lending markets was outlawed through anti-discrimination laws in the Community Reinvestment Act of 1977, we may expect – and hope – to see legislative action to ensure the same protections in the online marketplace.

JOURNEY TO GEORGETOWN

Sood's path into academia was not inspired by a passion for research or a desire to teach, but rather a thirst for learning. "It is a mystery," he says, describing his decision to pursue a PhD Academia in India—he emigrated from India more than a decade ago—which, like in many developing countries, is an unorthodox career choice. "Since no one among my friends or family had a PhD, it was something that I didn't understand completely. I sort of went into it blindly." And yet, blindly or otherwise, his curiosity has led him all the way to being a founding member of the MDI at Georgetown University.

Sood will use his time under the fellowship to pursue a range of research interests. "I broadly see myself as a social scientist. I don't feel constrained in terms of what kind of things I should want to study. There are lots of topics that I'm curious about, and data can shed light on a variety of questions." Some of Sood's previous work has focused on political partisanship. While exploring correlations between how people feel about the Democratic and Republican parties and their policy positions, he had one of the "eureka moments" he hoped a life devoted to learning might bring: to his surprise, his analysis showed that these correlations tend to be relatively trivial. In other words, party choice in America often has little to do with our actual beliefs. In reality, the overlap between Democrats and Republicans on policy positions are actually quite extensive, but average Americans usually do not see the similarities. To quote Sood, "They think the other party lives on Pluto, which is not even a planet anymore, right?" The negative associations, even feelings of hate, for the opposing party are often not founded on deep moral or ideological differences. "We know that hatred and love between people is sometimes determined by really trivial things. For instance, color of skin, why small—many a times substantively immaterial—differences divide people deeply is one of the oldest questions in social science. Politics is just another example of that."

POLITICAL POLARIZATION, THE MEDIA, AND NET NEUTRALITY

The rise of partisan cable news has exacerbated the divide between Democrats and Republicans. In a 2013 study analyzing the effect of access to ideologically distinctive news sources, Georgetown researchers Daniel Hopkins and Jonathan Ladd concluded "citizens often respond to political messages from candidates and news outlets differently depending on

their partisan predisposition." Partisan cable news such as the liberal MSNBC or conservative Fox News reinforce the voting tendencies of voters who already share the network's ideological worldview. This phenomenon not only heightens the partisan news media, but it also leaves a more polarized electorate. McCourt School Professor Micah Jensen, whose research focuses on identity politics and political behavior, suggests that the "force that mobilizes members of groups to political action can also increase discriminatory attitudes and behaviors between groups; a process which may help to explain our increasingly polarized politics."

In some of his recent research, Sood expands his work on political polarization to examine how access to broadband Internet affects political attitudes. A seemingly trivial but relevant point is that people with access to broadband internet consume more media than those without it. Americans spend much of their time consuming media. A 2013 survey of American time use by the Bureau of Labor Statistics found that Americans spent more than half of their leisure time—approximately 2.8 hours per day—watching TV, trumping time spent socializing with friends or attending social events. Nielsen, a global marketing research firm, released a US Digital Consumer Report (2014) revealing that the average American spends approximately 60 hours per week consuming news media across an average of four digital devices. Media consumption has "become a full time job," Sood reflects. The Telecommunications Act of 1996 gave local governments jurisdiction to regulate and price the rights of way—the physical space, wires, conduits, poles, and corridors passing through public land that enable broadband providers to build an internet infrastructure in a given neighborhood. Exploiting differences in rights of way and broadband availability, Sood discovered that "going from no internet to dial-up to broadband has a sizeable effect on media consumption." His research suggests that regulations that lower the cost of broadband internet polarize rank-and-file partisans, likely by increasing their exposure to partisan news media (2015). "Broadband access causes people to consume a lot more media, much of it non-political. But the little additional political media they consume polarizes them."

From a supply perspective, greater broadband access increases competition. This increased competition "depletes the quality of news outlets." With news providers looking to stand out from the competition, viewers should expect to find a greater menu of entertainment and sports news—not better political coverage. Americans anxious to satisfy their appetite for streaming high-definition videos on YouTube and Netflix, or joining an online gaming session, may rejoice over the Federal Communications Commission (FCC) net neutrality ruling in 2015 to regulate high-speed internet. Classifying broadband internet as a public utility, this ruling prevents providers from charging higher fees for faster Internet speeds. The ruling has left regulators at opposite sides of the table. Dwelling on his experience as an entrepreneur, FCC Chairman Tom Wheeler defended the ruling, citing that a fast, fair, and open Internet is imperative to innovation and human expression. On the other hand, FTC Commissioner Joshua D. Wright testified that the net neutrality ruling "does not make sense from an economic perspective" and leaves consumers "worse off" (2015). Wright criticizes the FCC for threatening "to strip the FTC of

its jurisdiction to regulate broadband providers of its consumer protection mission" by classifying Internet as a public utility. Wright dismissed Wheeler's "gatekeeper" justification, challenging that "no broadband provider can be viewed as a gatekeeper to anything when there is viable competition from other broadband providers." When weighing in on the net neutrality debate, Sood believes business concerns are the primary motivator. Broadband service providers are eager to please their digital customers, but for a price. "All this comes down to is the ability to charge for how much people consume," Sood remarked. With top cable trade groups representing service giants such as AT&T and Verizon expected to sue the FCC over net neutrality, aspiring YouTube stars, Netflix binge watchers, and avid gamers may need to accept that their virtual victory could be short-lived.

Our media-dependent culture is contributing to our inability to relate to those with different views. We choose our media sources and curate our online networks in ways that limit our exposure to opposing perspectives. And unfortunately, the information we are hearing often misrepresents the underlying data, to the frustration of Sood.

"Academia allows you to pursue perfection. That pursuit defines us and broadens both the people who produce it and the people who consume it. I want to produce papers that achieve the highest standards of academic research." These ideals stand in contrast with the reality of most news media. Sood believes that the most important message that Americans can draw from the rise of massive data is to pay attention to facts and statistics. Ultimately, "It is very easy to be vague and misrepresent things very convincingly. Pay attention to phrasing, and decide based on probabilities rather than possibilities. Anything is possible, but it is what is probable that really matters." With the MDI, hopefully we can get closer to achieving this standard.

REFERENCES

American Time Use Survey – 2013 Results. 18 June 2014. Bureau of Labor Statistics. http://www.bls.gov/news.release/atus.nr0.htm

Center for Data and Technology. 2015. *Coalition Letter to President Regarding Consumer Privacy Bill of Rights*. https://cdt.org/insight/coalition-letter-to-president-regarding-consumer-privacy-bill-of-rights/

The Connected World: Examining the Internet of Things: Hearing Before the Committee on Commerce, Science, and Transportation, United States Senate, 114th Congress (2015). http://www.commerce.senate.gov/public/index.cfm?p=Hearings&ContentRecord_id=d3e33bde-30fd-4899-b30d-906b47e-117ca&ContentType_id=14f995b9-dfa5-407a-9d35-56cc7152a7ed&Group_id=b06c39af-e033-4cba-9221-de668ca1978a

Hopkins, Daniel J. and Jonathan M. Ladd. "The Consequences of Broader Media Choice: Evidence from the Expansion of Fox News." *Quarterly Journal of Political Science* 9 (2014): 115-135.

Madden, Mary. 2014. "Public Perceptions of Privacy and Security in the Post-Snowden Era." http://www.pewinternet.org/2014/11/12/public-privacy-perceptions/

Schneier, Bruce. 2010. "The Security Mirage." TED. http://www.ted.com/talks/bruce_schneier?awesm=on.ted.com_Schneier&utm_content=awesm-bookmarklet&utm_medium=on.ted.com-static&utm_source=direct-on.ted.com

Sood, Gaurav. 2015. *The Hostile Audience: The Effect of Access to Broadband Internet on Partisan Affect.* http://www.gsood.com/research/papers/BroadbandPolarization.pdf

The US Digital Consumer Report. 10 February 2014. Nielson. http://www.nielsen.com/us/en/insights/reports/2014/the-us-digital-consumer-report.html

White House. 2012. "Consumer Data Privacy in a Networked World: a Framework for Protecting Privacy and Promoting Innovation in the Global Digital Economy." https://www.whitehouse.gov/sites/default/files/privacy-final.pdf

White House. 2014. "Big Data: Seizing Opportunities, Preserving Values." https://www.whitehouse.gov/sites/default/files/docs/big_data_privacy_report_may_1_2014.pdf

White House. 2015. "Administration Discussion Draft: Consumer Privacy Bill of Rights Act of 2015." https://www.whitehouse.gov/sites/default/files/omb/legislative/letters/cpbr-act-of-2015-discussion-draft.pdf

Wright, Joshua D. 2015. Prepared Statement of Commissioner Joshua D. Wright Federal Trade Commission on Wrecking the Internet to Save It? The FCC's Net Neutrality Rule Before the US capture as "the subversion of regulatory agencies by the firms they regulate" (2014 p. 49). And Carpenter and Moss define it thus: when "regulation, in law or application, is consistently or repeatedly directed away from the public interest and toward the interests of the regulated industry, by the intent and action of the industry itself" (2014 p. 13).

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