

NATIONAL SECURITY IN THE NEW MILLENNIUM

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| Special Thanks | We would like to express our infinite gratitude to Qursum Qasim, Jinny Admundson, David Boyer, Darlene Brown, Leslie Evertz, Joe Ferrara, Barbara Schone, Kerry Pace, Dave Cooper, Nick Florez, Danielle Griswold, Matt Bugeaud, Mo Alloush, Ed Montgomery, and the Georgetown Public Policy Institute |
| Cover Design | www.acecreative.biz |
| Interior Design & Printer | Todd Allan Printing |

The Georgetown Public Policy Review publishes articles that contribute to the thoughtful discourse of public policy. *The Review* focuses each issue around a theme chosen in advance that is addressed with relevant research articles, opinion pieces, book reviews, and interviews.

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One issue of *The Review* costs \$10.00 for an individual and \$20.00 for an institution. For individuals and institutions outside the United States, rates are \$17.00 and \$27.00, respectively. This includes postage and packaging. To order or renew a subscription, please send a check payable to *The Georgetown Public Policy Review* to our mailing address above.

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THE GEORGETOWN PUBLIC POLICY REVIEW (ISN 1083-7523) 2010-11 VOL. 16, NO. 1.
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EDITOR'S REMARKS

A decade ago, few Americans would've recognized the name of Osama bin Laden. The idea of a Homeland Security multi-billion dollar bureaucracy would've been unfathomable to most. Iraq would be associated with a 210 day, \$6 billion Persian Gulf conflict under the first President Bush. A decade ago, the world was a different place. The American economy, culture, and international posture hardly resemble what we see today. Then the single biggest shock in a generation hit on the morning of September 11, 2001. Nearly ten years later, the Georgetown Public Policy Institute community – who lost one of our own, Leslie Whittington, on that haunting day – thought it appropriate to revisit this last decade and events transpired. It is with this in mind that we chose to focus on “National Security in the New Millennium” for this landmark issue.

This year's staff sat down with the foremost authorities on national security policy including Senator Chuck Hagel, who served on the Foreign Relations and Intelligence Committees, as well as Wendy Chamberlin, who was the United States Ambassador to Pakistan at the time of the 9/11 attacks and now leads the Middle East Institute. Their unique perspectives and expansive knowledge as reflected in these pages is a must-read for those hoping to understand the most pivotal decade in our nation's modern history.

Adding to the extraordinary depth of this publication is an interview with Dr. Alice Rivlin, a Georgetown Public Policy Institute professor, founding Director of the Congressional Budget Office, former Director of the Office of Management and Budget, Senior Fellow at the Brookings Institution, and member of President Obama's National Commission on Fiscal Responsibility and Reform on the economic implications of decade-long military engagements.

Further, an interview with Rudy de Leon, former Deputy Secretary of Defense and accomplished national security professional at the Center for American Progress, speaks to the strain between civil liberties and security vigilance. While a discussion with policy commentator and *Washington Note* publisher, Steve Clemons, touches on progress of the last decade, valuable lessons learned, and our future vulnerabilities.

We cannot sufficiently express our gratitude to these leading experts for agreeing to lend their time and expertise for the pages of this journal.

Andrew Eck's research focuses on fighting terrorism, not on the battlefield, but through financial instruments. Eck maps out the struggle of the last ten years and upcoming challenges: while the United States government has greatly suppressed financiers of terrorism since

9/11, the opposition continues to adapt. In the escalating struggle to cripple those that wish us harm, our nation partners with countries around the globe to cut off terrorists' resources.

Because national security and energy security are inextricably linked, Adi Dabholkar's research on clean energy was an indispensable piece of this year's publication. He explores the underutilized tools of public-private partnerships that would increase investment in clean energy technologies. Further, former Assistant Treasury Secretary, and Georgetown University graduate and friend, Thomas Healey writes an issue highlight on international water scarcity.

Lastly, the *Review* decided to reserve space in this year's edition for a recent GPPI graduate to publish. The research chosen for this year was Andrew Rothman's (MPP '10) thesis on the relationship between farm share and body mass index in the United States. His work represents some of the very best GPPI has to offer, and we are very proud to include Andrew's hard work in our publication.

On behalf of the *Georgetown Public Policy Review*, I would like to thank the authors for the countless hours they have spent on their articles and giving us the opportunity to share their research.

This year's edition has been a resounding success because of the enthusiasm and dedication of so many people. Words cannot express my personal gratitude to all the members of the *Georgetown Public Policy Review* staff, particularly the infinitely talented members of the Executive Board. Michael, Rachel, Tamar, Amanda, and Nikki, it was an absolute pleasure meeting the year's challenges with all of you.

Special thanks must be extended to our friends and allies that showed tremendous generosity with their time. On behalf of the entire staff, I'd like to express our gratitude to Robert Bednarzik, Donald Marron, Matthew Fleming, Neal Pollard, Paul Pillar, Keir Lieber, Qursum Qasim, Jinny Admundson, David Boyer, Darlene Brown, Leslie Evertz, Joe Ferrara, Barbara Schone, Kerry Pace, Dave Cooper, Nick Florek, Danielle Griswold, Matt Bugeaud, Mo Alloush, and Ed Montgomery.

Finally, I want to thank every member of the *Review* staff. From beginning to end, all of your contributions made for a milestone year. Our online presence, business development, and print staff all broke new ground and made this year the best yet.

Congratulations *GPPR* on an exceptional year.

Laura Hatafsky

Editor-in-Chief

CHARLES “CHUCK” HAGEL
UNITED STATES SENATOR
FROM NEBRASKA, 1997 — 2009
An Interview by Heather Vaughan

Chuck Hagel is a distinguished professor at Georgetown University and the University of Nebraska at Omaha. He is co-chairman of the president’s Intelligence Advisory Board; chairman of the Atlantic Council; a member of the secretary of defense’s Defense Policy Board and the secretary of energy’s Blue Ribbon Commission on America’s Nuclear Future; and is a member of the Public Broadcasting Service’s board of directors. He also serves on the board of directors of Chevron Corporation; the advisory boards of Deutsche Bank Americas, Corsair Capital, and M.I.C. Industries; is a director of the Zurich Holding Company of America; and is a senior adviser to McCarthy Capital Corporation. Hagel served two terms in the United States Senate (1997-2009) representing the State of Nebraska. He was a senior member of the Senate Foreign Relations; Banking, Housing, and Urban Affairs; and Intelligence Committees. Senator Hagel is a combat Vietnam veteran and a former deputy administrator of the Veterans Administration. Senator Hagel is the author of the recently published *America: Our Next Chapter*.

GPPR: The impetus and overarching theme of the *Georgetown Public Policy Review* this year is the state of national security ten years after September 11th. Let’s begin by getting your thoughts on that. Do you believe we’re safer today? What have we done to improve national security in that time?

Chuck Hagel: The United States of America is safer and more secure today than it was on September 11, 2001. That is because the Congress, the president, America’s citizens, and all our institutions recognized the threat that faced our country in 2001 and the threat of more sophisticated terrorist acts in the future. The Congress and the president worked together to do a number of things.

First, we consolidated our intelligence agencies – the 15 independent agencies. That consolidation is still being implemented, but what that has done and will continue to do is bring more cohesive and coherent information sharing to the overall intelligence framework. It also brought intelligence into a real-time dynamic that we didn't always have previously. So our people on the ground, our military, our decision makers, and in particular, the president and his national security people are getting the maximum amount of relevant, timely intelligence for big decisions. So the intelligence agencies coming together in a more coherent sharing way was a big part of the last ten years, and we're still not finished.

Second, we consolidated 22 departments and agencies under one new Department of Homeland Security. Now that's still being worked out – there are a lot of management issues. We rolled up 22 departments into one, and there are different cultures, different backgrounds, and different objectives. But even with the difficulties and adjustments we're working through, in the end I think it was the right thing to do. It brought a more strategic emphasis to using our resources to the 21st century threats that face our country. Until that consolidation, there was really no central homeland security office. You had different pieces, but this really consolidates it in a way where it's not only manageable, but more to the point, it utilizes and gets maximum return from all of these agencies,

resources, and people.

The third area we must assess ourselves on is the military. We're better off and more secure today because the military has been reshaped, although not to where it needs to be. [Secretary of Defense Robert] Gates has talked about it; [former Secretary of Defense Donald] Rumsfeld talked about it; all our commanders talk about it: we need to transform our military to be better prepared for these 21st century threats and challenges. And we're still working on that, but the military has made astounding progress. It's more agile and more flexible, with capabilities that we didn't have ten years ago to address big issues before they get to be bigger issues.

Fourth, our institutions and our communities have adapted – meaning not just police forces and state governments, but businesses, NGOs, and educational institutions. Over the last ten years all of these organizations have started to address security challenges. Universities are a good example – Georgetown is a very good example. Ten years ago – and I suspect this is the case with most universities – you didn't have the same kind of emphasis on security issues. You didn't have centers dedicated to studying these issues. You didn't have people coming in to build programs on security. They were usually an adjunct to some other department. That's a huge part of this because you're developing the next set of leaders. Their cultural take on security and their early absorption into it gives a whole new dimension to the next set of leaders

that will govern our country. That wasn't the case 20 years ago.

The last reason I believe we're better off is the collaboration with our allies. Alliances are critically important today. Look around the world – every issue, whether it's Libya, Afghanistan, or Iraq requires alliances and cooperation. And that really begins with developing seamless networks of information and intelligence that we gather and share with our allies. The point is to stop a terrorist attack before it's perpetrated. The only way you can do this is with intelligence. And you cannot do it without the cooperation of the countries and regions where these terrorists are bred. Pakistan is a good example. And I know a lot of people are not happy with Pakistan, but we've got to have their cooperation. Wherever you go, it's those intelligence relationships that make the difference.

So I think those are the five factors are really important to think about when you're reviewing what we've done in the last ten years. All of these achievements are imperfect, all need more work, but nonetheless I think that's an important outline of items that have been accomplished.

GPPR: Is there a conflict between improving our security and maintaining our liberties?

Have we sacrificed freedom to improve our safety?

Chuck Hagel: That is very big issue that I don't think the American people nor the Congress in the past ten years have paid enough attention to. I was

one of four Republicans that put a hold on the Patriot Act Reauthorization [in 2005]. It's not that we four Republicans or any of the Democrats were any less committed to the security of this country, but as I have often said, don't ever give up one freedom in a tradeoff for security.

First of all, I think it's a false premise. We have done pretty well in America for 250 years without giving up liberties and still we have kept our nation as secure as any on Earth. In fact, we've added to our rights with our Constitutional amendments. Ninety-six years ago, women could not vote in America. When we set up this grand republic, unless you were a white male landowner, you didn't have that right. They said nice things in the Constitution about all men being created equal, but that's not the way it worked in reality. So we self-corrected and changed a lot of the things that needed changing. So what does that have to do with rights and terrorism? You don't need to give up rights as a tradeoff for security. It never works out anyway. And rarely do you have a situation where people give rights up and they ever get them back.

This was a big debate between the Bush White House and the Congress. President Bush felt that as commander in chief, he could make all the decisions about what was or was not important for protecting our country. So we had some pretty interesting exchanges with the Bush White House on these issues. But I think early on Congress abdicated much of its responsibility on these issues. I think history is not going to be

kind to either the Bush Administration or Congress on these issues. I don't think Congress did their job of asking the tough questions on how we got into these wars, and why, and how long we were going to be there. Some of us did ask questions, but they weren't answered. Now ten years later we have more troops in Afghanistan than we ever did, we're spending more money and we have more casualties. And we still don't know how to get out of Iraq after eight years. We're skirting with this situation in Libya. Point being: question the government. Question the policies. Question why society is being asked to give up a right. Question whether monitoring phone calls or bank accounts really keeps us safer. Let's be careful there, let's take a look. Those are issues that are still playing out.

I don't think Congress did their job of asking the tough questions on how we got into these wars, and why, and how long we were going to be there.

GPPR: I want to push you a little further on that. It's rare that we're asked outright to give up a right. But there are small encroachments on our freedoms; for instance, on our right to privacy. We accept it as common practice to share information with the government today that twenty years ago we might have balked at as intrusive.

Chuck Hagel: I think that this is a vital question. When you start getting

into privacy issues, you hear, "Well, if you don't have anything to hide, why would you mind having your phone calls monitored, or your emails, or your web browsing, or your bank account? You're a law-abiding citizen, aren't you? Do you have something to hide?" This is the slow encroachment. It starts with that, but it can turn into the government saying, "Well, we need to know something about your friends." You give up more and more. Some people ridicule that. They say the atrocities that happened with dictators in the past can't happen again because we have mass media now. We wouldn't let it get that far. But the insidiousness of slow encroachment is what you have to watch. That's why we must debate these issues in Congress. Let it be transparent. Let the American public know what's going on. That's the strength of democracy: an informed public. Then if your representatives and the president agree that it should be done, it's done in the open. I've always had great confidence in our country that if nothing else, we tend to get that right. But that doesn't mean that can't be taken away if we're not careful.

GPPR: In your book, you mention the economy as a critical factor in our national security. You also discuss how economic inequalities help contribute to the growth of terrorism. How are those issues related?

Without economic freedom, people do not have choices or independence. Every specific freedom that is noted in our Constitution and Bill of Rights would fall apart without economic

freedom. Every other freedom will atrophy before the basic necessities of life.

Many of these countries have not been the recipients of the great advancements since World War II that most of the western world has enjoyed. We've benefited from economic prosperity, science, technology, and all these great new revelations in medicine and health care. When we examine these trouble spots around the world, we ask why are some of these people captive to dictators and terrorists like Bin Laden? There's a religious fervor in this which drives some of this. But when people have no hope, when they're chained to a cycle of despair, when they lack water and basic necessities that prosperous countries take for granted, something is going to happen. I don't blame all terrorism on poverty, but when you combine all of those dynamics into one region, that is about as combustible a dynamic as you can get. Anything can set that off.

We've seen a lot of that in the last 90 days in North Africa and the Middle East. Every country is different and every situation is different, but very little good comes out of those big reservoirs of poverty and hopelessness. They're easy prey for people who will distort God and religious fervor. When people are in a position where they have nothing, where they have no hope, they're going to reach for something.

So my point has always been: when you're looking at terrorism, you have to go beneath it. You have to look at the causes. Yes, you've got to stop it, but

you need to utilize all of your foreign policy tools to do that, and I'm not sure over the years we've done a very good job of that.

For instance, take our association with [recently deposed Egyptian President Hosni] Mubarak for the past 30 years. He was important because he fulfilled the terms of the bilateral Israeli-Egypt peace treaty. He essentially kept that area stable. Israel had a reliable partner, and we had a reliable partner in the Suez Canal. He was involved in a lot of our vital interests. But that came at a price. He was a tyrant – a dictator. But we tried to sugarcoat it by saying he had elections. Come on. Those weren't free and fair elections.

So there are tradeoffs in this business and it's always imperfect, it's always difficult, and there's always a great hypocrisy zone in this. We're for values, we're for standards, we're for freedom, we're for democracy, but we also have a vital interest to keep the Suez Canal open to transport 40 percent of the world's oil. How do you balance that?

Back to your point, it's vitally important that we factor in all our instruments of power as we take positions in this part of the world that are vulnerable to terrorism. You've got to figure out what the cause of this or you never can fix it. We're seen as oppressors and occupiers in Iraq and Afghanistan. The American people are shocked by that; how can that be? We've lost 6,000 Americans, tens of thousands have been wounded, all because we're trying to help them. Yes, but we didn't assess this very carefully

because these are worlds that are so different from ours. That doesn't mean we shouldn't be involved, but we have to understand it better. And we can't fix it all.

This is part of the debate on Libya – why get involved in Libya and not Sudan or the Ivory Coast? Their people are being massacred by their tyrants. Actually, there has not been a massacre in Libya. [President of the Council on Foreign Relations] Richard Haass testified before the Senate Foreign Relations Committee two days ago and said that the whole premise of Gadhafi going east and massacring his people was flawed.¹ There was never any evidence of that. Some of the president's people said it might happen and so we can't let that happen.

But we have to do a better job of how we are seen as well – reversing the optics. We have to consider how we're viewed by this next generation of citizens in this region. They are combustible because 60 to 70 percent of these countries are under the age of 20. Where are they headed? What are they going to do? They have no education and no prospects. We're only at the beginning of these problems.

GPPR: One of your criticisms of the war in Iraq was that we didn't have our goals laid out at the outset. With Libya, it seems like we're seeing that problem again. How do we define success in Libya? Are we in a position to meet with success?

Chuck Hagel: We can't view this as a question of win or lose. There are too many cultural, ethnic, and religious

dynamics at play for us to control. I told Secretary Gates the other day, it seems to me if there was ever a clear early 21st century case of the limitations of American power, it is our situation in Libya. And you can extrapolate from this situation in Libya across that entire area. After ten years in Afghanistan and eight years in Iraq, we still haven't done whatever we were supposed to do. Great powers really do have limitations. We are very limited in what we can do in Libya.

One option being put forth by Lindsay Graham, John McCain and Joe Lieberman is that we ought to go into Tripoli, put boots on the ground, and go after Gadhafi. That's one option. I don't agree with it, though, because what will that get us? Ten years in another war? As Colin Powell said, it's the Pottery Barn rule: you break it, you own it. We broke Iraq so we own it. Now people say, "We can't just leave them." Well, why didn't we think about that? Why didn't someone answer some of these questions about who is going to govern, how they will govern, what it will cost the U.S., how long are we going to be there, and what coalitions are going to come together? Now we're living it.

We can't go around the world and dictate and interfere and say we don't like a certain leader like [Libyan ruler Moammar] Gadhafi. Someone will have to come into power after Gadhafi. Look at Iraq and [Prime Minister Nouri] Maliki (*sic*). We may end up with another dictator there. Someone will replace Gadhafi, but there's a vacuum. There's a vacuum in

Egypt and Tunisia too, but those were different. Those were revolutions that were inspired by young people and driven by technology. It wasn't anti-American or anti-Israeli.

We have very limited options on what we can do. Secretary Gates said to Congress three weeks ago, there's a lot of loose talk about taking out air defense systems. Let me explain what that means. It means going to war. It means attacking another country. It's complicated, it means resources – he went through the whole thing. What do you want to accomplish with that? Now we're all befuddled. President Obama said Gadhafi must go. Is that our policy? Regime change? Well then, what are we going to do to fulfill our policy of no boots on the ground? Now the rebels are upset with us and with NATO because we're not doing enough. This is all part of the complications and limitations. In my opinion, Libya was a mistake. The first mistake we made was the president saying Gadhafi has to go. When the president of the United States speaks, it echoes around the world. So what happens if Gadhafi stays? Do we lose face? Have we disappointed people saying that the U.S. and NATO didn't fulfill what we said we would do?

The same questions I asked about Iraq and Afghanistan, you have to ask these.

I don't know about Libya. You always have to be hopeful. In Libya, the rebels, we really don't know who they are. We do have intelligence that says there is a combination of a lot of dangerous elements in that crowd, which is

obviously why we're not arming them. We know that there are unsavory characters that want to take Gadhafi down. These are good examples about how you can get yourself into a lot of trouble. This goes back to my point about limitations – we're very limited in what we can actually do there. And this also goes back to my point about alliances. There's not a situation in the Middle East, North Africa, Central Asia, or that entire arc that is going to be resolved without enough members of an alliance coming together to work these things through.

In foreign policy, there is rarely a situation where you have good options. You're normally faced with bad options. But we have to make a decision – we're the most sophisticated, powerful nation in the world.

GPPR: It seems to me that President Obama is trying to avoid following in his predecessor's footsteps by not committing to troops on the ground and by not committing to nation-building. Can you still engage in another country if you don't want to commit to these things? Do you see this so-called "Obama Doctrine" as an appropriate framework for making decision on foreign policy?

Chuck Hagel: In America, we have a problem because the media and our political dialogue demand a one-sentence articulation of everything. On the Sunday morning talk shows

you have to give a five-second answer to a very complicated question. That's what we demand. So we get ourselves in trouble. It's more complicated than that. In foreign policy, there is rarely a situation where you have good options. You're normally faced with bad options. But we have to make a decision – we're the most sophisticated, powerful nation in the world. People look to us to lead. It doesn't mean that we always have to have the answer. We shouldn't always try to be the one with the absolute answer on everything. There is no answer many times, and certainly no good options in most cases.

So what you do is try to weigh your own sovereign vital interests with alliance interest and with longer-term regional interests. And you weigh these with who we are as Americans – what are our values? Our principles? Our standards? Do we stand for individual liberty? Do we stand for democracy? Well, we say we do, but you have to balance those and you have to make some choices and some adjustments and make some imperfect systems work.

I don't know about an "Obama Doctrine." I think in the complicated, interrelated, and combustible world we live in today it's hard to have a doctrine. Even within North Africa and the Middle East, each situation is different, each country is different, and each dynamic is different. So how do you frame a foreign policy that's consistent and applies to every situation? You can't do it.

You can have principles and you can work within a framework of those principles. You balance your interests, your values, and so on. We got in trouble in Iraq when we tried to explain why we were there – we hit on democracy. Democracy is not the answer for everything. Take Gaza, for instance. We knew Hamas was going to win the elections there. But when they did, America – the great champion of democracy – refused to acknowledge their government, even though the United Nations and outside observers said it was a free and fair election. Democracy has not fixed the problem there.

Generally some form of democracy works best because, if nothing else, democracy is about individual rights. But it doesn't fit the same way everywhere; therefore, I don't think you can come up with a general foreign policy that fits all cases. In the past, we had the Monroe Doctrine and the Eisenhower Doctrine, but every one of those doctrines was at a time when the world was less complicated. There was no mass media, no telecommunications, no weapons of mass destruction, no extremist movements. These are new realities that make the world so much more complicated now.

If you look at the demographics of the world, you can see where the problems are going to be. In the next 25 years, what do we do with all of these young people? The *Wall Street Journal* recently ran an article that said that for every 100 bright young Indians with college degrees, only about three are

employable. India is going to be the most populous country in the world in 25 years. And you keep rotating those young, smart people out with educations and expectations and there's nothing there for them. And this is the higher strata of societies!

GPPR: You mention rising populations and corresponding unemployment in India as one future challenge that needs to be addressed. What are some of the other challenges you see facing the U.S. in the next few decades?

Chuck Hagel: Well, I go back to where I started: the economy. We've got to ensure that our system remains the most flexible, innovative, competitive economy in the world. But there are so many challenges – starting with \$14.5 trillion in debt. We have long term entitlement programs we're obligated to that we can't sustain. That's going to cut into our base of opportunity, but it will also cut into funding our discretionary requirements: defense, foreign policy, education, infrastructure, and agriculture. They'll all be limited. That affects our young people, our job opportunities, and our position in the world. The economy has to be as big a part of foreign policy as anything else. President Obama asked four of us to write him a memo and tell him where each of us thought his foreign policy priorities should be. I started with the economy and trade, because everything comes from that – everything flows from that. If you don't have any money, you don't have many options. If we don't have the capacity as a nation to protect our interests and

maintain what we feel is important for a competitive position in the world, then we're going to have a huge problem that we'll never recover from.

We're going to have issues that we'll be dealing with for the foreseeable future – North Korea, Iran, the Middle East, Central Asia – these are all areas that aren't going to get fixed right away. They're going to be with us for a long time. So we have got to be smart in how we utilize all of our instruments of power. We have many instruments of power, starting with the strength of our economy. We also have diplomacy, trade, intelligence, military, and relationships. How we use those will determine America's future.

ENDNOTES

1 In testimony before the Senate Foreign Relations Committee on April 6, 2011, Haass, president of the Council on Foreign Relations, said, "It is not clear that a humanitarian catastrophe was imminent in the eastern Libyan city of Benghazi. There had been no reports of large scale massacres up to that point, and Libyan society (unlike Rwanda, to cite the obvious influential precedent) is not divided along a single or defining fault line. Gaddafi saw the rebels as enemies for political reasons, not for their ethnic or tribal associations. To be sure, civilians would have been killed in an assault on the city – civil wars are by their nature violent and destructive – but there is no evidence of which I am aware that civilians per se would have been targeted on a large scale."

WENDY CHAMBERLIN

FORMER U.S. AMBASSADOR TO PAKISTAN, 2001—2002

An Interview by Qursum Qasim

Wendy Chamberlin was the U.S. ambassador to Pakistan from July 2001 to June 2002, where she established crucial working relationships in a country critical to U.S. national security. Ambassador Chamberlin is a twenty-eight year veteran of the State Department, working in locations as diverse as Laos and Malaysia. She has also held diplomatic posts in Morocco and Zaire. She went on to serve as the Assistant Administrator at the United States Agency for International Development. In 2003, she joined the UN High Commission on Refugees as the Deputy High Commissioner. In 2007, she took over as president of the Middle East Institute in Washington, D.C. With regional expertise in Pakistan and the Sudan, Ambassador Chamberlin focuses on areas of women's issues, terrorism, development, and education.

GPPR: What do you think has been the most significant change in American national security policy in the past decade?

Wendy Chamberlin: There has been plenty of introspection on this issue by the 9/11 Commission. Before I went to Pakistan in August 2001, only one month before the attack on the World Trade Center and the Pentagon, we knew who the enemy was. We knew it was Osama Bin Laden. We had been attacked by Al Qaeda more than once. The USS Cole and the embassies in Africa had been attacked and we were getting a great deal of intelligence that he was planning something bigger. We knew that! Intelligence was reporting it. The senior advisor at the White House, Richard Clarke, had written a memo to the president and Condoleezza Rice briefing them that Osama Bin Laden was going to attack. The CIA director was anxious about it. We knew who was organizing it – Osama Bin Laden and Al Qaeda. We knew where he was. We didn't know what it would be, we had no idea of its scale, but we

knew something big was coming.

We even had officials inside the government who were arguing for stepped-up measures that would cross a line we had never crossed before, to go preemptively after Osama Bin Laden. That line was to arm drones. Our drones had found Osama Bin Laden inside training camps in Afghanistan with cameras, but before 9/11 they were not armed with missiles. There had been proposals to arm them and to preemptively take out Osama Bin Laden. But prior to 9/11, the decision was made not to do that.

“There were courageous people such as Johnny Jumper of the Air Force, who argued in favor of arming drones, and Richard Clarke, who pushed for preemptive strikes against Osama Bin Laden. They saw a major terrorist incident coming and were sounding the alarm.”

That was a hard decision to make, and there has been criticism for not making it. There were laws on the books that said we couldn't assassinate foreigners; preemptive strikes were also a step beyond where we had been before. 9/11 did change thinking on this. There were courageous people such as Johnny Jumper of the Air Force, who argued in favor of arming drones, and Richard Clarke, who pushed for preemptive strikes against Osama Bin Laden. They saw a major terrorist incident coming and were sounding the alarm.

Their recommendations gained more traction after 9/11.

I think perhaps in our panic we went too far in some respects. And this is my own personal view, that we went too far with some provisions in the Patriot Act. Moving backwards on centuries of American values with regards to torture was wrong. Obama was elected to turn that around and to walk back some of the more egregious provisions of the Patriot Act. We already see some push back on the more intrusive measures of security checks for travelers. Now we're being more thoughtful about how it can be done without compromising security. I think there is a balance that we are now searching for.

The pendulum on national security was swung too far out by a panicked nation. Now we are beginning to see it move back. Some say not fast enough, and some say it's too fast.

GPPR: What do you see as the next steps in the evolution of national security policy? You mentioned rapid response and the attendant concerns about extreme response. Do you see a balance whereby institutions are adaptable and responsive while being able to calibrate their response appropriately?

Wendy Chamberlin: The challenge here is of thoughtful leadership. The number one responsibility of the president, of any national leader, is the security of their citizens. That's the fundamental reason for the existence of a government. The devil, however, lies in the details and in how you define the threat to citizens' security

and response. Certainly in the early days of the Bush administration, the declaration of the War on Terror was not challenged or questioned. We had a national consensus on declaring the war on terrorism. As time passed, people began to review the policy and consider the nature of terrorism. It isn't a nation-state and the U.S. army cannot go to war against an action. It's extra-national; not something tangible. So the approach began to change.

Those issues were articulated very clearly in the last presidential campaign. As a result of these concerns about the response to terrorism, the pendulum has started to swing back. Obama was elected due to the reaction and overreaction to 9/11. Once in office, when you actually have to get into details, it gets difficult. Is it dangerous to U.S. citizens to try terrorists in civilian courts? Is it dangerous to bring them from Guantanamo to New York City or to hold them in prison in Illinois? There is a difference in opinion and that's the current debate. I think on some issues of national security, the debate has been held. Torture is wrong and waterboarding is wrong. Some say not, but the majority agrees that it is. Issue by issue we, as a nation, are debating and reaching a balance.

GPPR: In the recent midterm elections, the debate about the economy trumped concerns about not just the wars but also much of this debate about national security. How do you think the rising deficit and economic constraints will interact with national security? How is that

dynamic going to progress?

Wendy Chamberlin: It is my personal view that there is an enormous amount of misunderstanding about the economy and its security impact. The U.S. spends approximately 4.6% of its GDP on the military. European countries spend 1.5% or so. Greece is the only country that spends as much as the U.S.

We spend three to four times more than most other countries on our national defense. Can we sustain that? It's unsustainable. But this is not part of the debate on the economy. Defense spending is left out of any conversation about budget cuts. Even when the leadership of the Department of Defense goes to Congress and says they have too much money and they can't use it all. This is wrong and we need to cut back. Secretary Gates is being very clear and patriotic and honest. Congress throws money at defense which is an enormous amount of waste and doesn't result in better security. We need to redefine security.

We clearly have an economic slowdown, but I think there's a good deal of muddled thinking about how to get out of that. People who criticize the Troubled Assets Relief Program (TARP) offer no solutions for what would have happened if we had not had it. The stimulus, which clearly worked by any standard of objective economic evaluation, staved off international global meltdown. I think we, as a nation of pundits and media, are poor economists, and as long as that muddled economic analysis is

being seized as a political issue we're in trouble. We need to have a debate based on facts because the state of the economy is a national security issue.

GPPR: The foreign aspect of national security figures largely in debates about the issue. What should be done about the domestic aspect? What ideally should be the domestic focus?

Wendy Chamberlin: I made a trip to Detroit one and a half years ago and spent time with the local Muslim community. I then went to Indianapolis and interacted with the communities there. I also did this in Iowa City. I usually do this in the smaller cities.

I visited the mosques in these cities, and I heard respect for the initial FBI strategy of going into mosques and reaching out to the communities.

Tom Furrow, an FBI agent specifically named, had talked to people, organized community discussions, and developed understanding through town hall meetings. This process of dialogue and transparency showed respect.

“We need to have a debate based on facts because the state of the economy is a national security issue.”

The fact that the FBI respectfully entered into these communities and engaged them worked extremely well. We've seen this approach validated when communities have alerted the FBI when they thought some miscreants were going to create trouble. For example, in the case of the young man

from northern Virginia who left his local mosque and went to Pakistan, it was the mosque and the family who got worried about him that alerted the FBI. That's a system that works. And that's something that should be emphasized – working with communities.

I'm a little more nervous about sting ops. They might go too far in pushing people over the line. Certainly, if you have been alerted to people who're on the verge, who're intractable and are dead set on committing terrorist acts, then sting operations are the right thing to do. But we have to be very careful not to create criminals.

GPPR: The U.S. has faced difficulty in cementing its alliances with Pakistan and Afghanistan. There seems to be a slight disconnect in the long-term ambitions in the region – Pakistan tends to be more India-centric and U.S. objectives are different in terms of containing a global threat. How do you think those two things can be reconciled? What has been right and what has been wrong?

Wendy Chamberlin: Neither side is right. Both are wrong. Both Pakistan's military and elite India-centric phobia, and the anti-terror, single-focus policy of the U.S. miss the point.

The point is the people – the people of Pakistan. It is such a large population – 180 million extremely poor, mostly uneducated, underemployed or unemployed; and subject to natural disaster, poverty and illiteracy, living with a severely lacking health system. These issues will determine the direction of the region.

As long as the elites and the military of both countries are focused on priorities other than the people, they miss what should be the real focus and they'll remain on a collision course.

GPPR: What role does India have to play in this situation?

Wendy Chamberlin: It's very clear that the most serious threat to India's stability is Pakistan and instability in Pakistan. Everything India does should be from that perspective. Therefore, stabilizing Pakistan is good security for India.

This turns on its head past thinking that there's an ongoing confrontation and a zero-sum game whereby one country gains by the demise of the other. That's no longer the case. Helping Pakistan defeat its internal insurgency, helping Pakistan grow economically and remain democratic, educate her people, provide health, and jobs is in India's interests.

GPPR: What is the best case scenario here?

Easy to say, hard to achieve. Best case - Pakistan and Afghanistan are stable, secure governments that meet the aspirations of their people. They must offer jobs, provide education, health, and stimulate economic growth for their people.

GPPR: What are the particular challenges that are specific to Afghanistan? The linkages of the conflict with regional dynamics figure largely but apart from the obvious issues of the insurgency, what needs to be done?

Wendy Chamberlin: There's a severe leadership problem. What needs to be achieved foremost is leadership that is respected and is able to provide services to its people. It must not be seen as exploitative.

GPPR: Jishnu Das from the World Bank just wrote an article on the effect of humanitarian assistance on 'trust deficit' between the U.S. and Pakistan. What are your views on that?

Wendy Chamberlin: Just the notion that we give money and humanitarian assistance in order to cultivate leverage is wrong. The World Bank study shows that assistance was most effective during the earthquake when people saw it as being purely humanitarian, and recognized that the presence of the U.S. and international community was important to their survival. The minute it becomes transactional, the whole "we're giving you assistance in order to win hearts and minds so that we can fight our war," that's when we've lost the people.

GPPR: It is now clear that the Af-Pak region is no longer the only region under threat. Offshoots of Al Qaeda are now active in Yemen and Somalia, presenting multiple flashpoints. How should the diversity of these places and the unique challenges they present be addressed?

Wendy Chamberlin: I think the similarities in all these locations are more interesting. All four countries are places where the writ of the central government does not extend throughout the country, and people are yearning for and deprived of education,

health facilities, jobs, stability, and basic security. People in all these countries are victims to brutal insurgencies and don't receive essential services from the government. There's no security. The similarities scream louder.

GPPR: What issues in your view will dominate the national security debate over the next five years?

Wendy Chamberlin: Burden sharing. It is clear that the U.S., given the state of the economy, cannot bear the financial burden for the security of the entire world. Allies in Europe and the rest of the world must assume stronger roles. We cannot continue to do it alone.

“It is clear that the U.S., given the state of the economy, cannot bear the financial burden for the security of the entire world. Allies in Europe and the rest of the world must assume stronger roles. We cannot do it alone.”

Also, the whole issue of individual rights vs. security needs must come into balance. We're not there yet.

GPPR: How should the U.S. approach our strategic alliances in terms of maintaining them and taking them beyond the national security prism?

Wendy Chamberlin: Hal Saunders, a former national security advisor, wrote a book in which he advocates strongly for a paradigm change. I think it's in motion, and has been articulated

effectively by Hilary Clinton. There needs to be simultaneous shifts from government to government, state to state, military to military relations, and the focus should go to relationships that involve more civilian agencies and reflect the recognition that relations are people to people. You will see State Department policies and their operating strategies more reflective of the need to change. Diplomacy, more so than government to government relations, involves the private sector, education, and health sectors. Whole government, they call it. This is a paradigm shift which is welcome.

GPPR: The strategic dialogue between the U.S. and Pakistan – is that the sort of engagement you're advocating?

Wendy Chamberlin: That's still pre-paradigm shift – military to military and state to state. I'd like to see exchanges on the unofficial level. For example, at MEI we have a proposal to organize exchanges between NGO workers from Pakistan and the U.S. They don't just visit but actually come and work. From Pakistan, the young professors in their late 20's, early 30's, who work in organizations that help Pakistani people or in humanitarian organizations, would come here for nine months or so and work in the Red Cross or Teach for America, while Americans would work in the Edhi Foundation. And I mean really work! Get to know their local colleagues, work with communities. We have as much to learn from Pakistan as we do to teach. This is a people to people exchange.

GPPR: How do you view the future of national security? There are obviously a lot more influences on national security policy – the economy for one. Do you think domestically there is greater support for a new way of doing things?

Wendy Chamberlin: Domestically, Americans have a strong inclination towards isolationism, which is very dangerous. With the fall of the Berlin wall and the end of the Cold War, two things happened: the size of the world doubled and globalization accelerated. We used to operate in the free world, now we are present in the entire world. At the same time, globalization trends shrank the world. The manufacturer that produces wheels for suitcases is not a domestic manufacturing industry. It's a global industry. Everything we do is global. We have to understand the world and understand that we operate in the world.

ALICE RIVLIN

MEMBER OF THE NATIONAL COMMISSION ON FISCAL RESPONSIBILITY AND REFORM

Excerpts from an Interview by Ryan Greenfield and Chris Schreck.

Alice Rivlin is currently a senior fellow at the Brookings Institution and a visiting professor at the Georgetown Public Policy Institute. Formerly chair of the Congressional Budget Office during the 70's and 80's, OMB director under President Clinton, and vice chair of the Federal Reserve Board, Rivlin was asked to join President Obama's debt and deficit commission. The commission's findings were released in December 2010. Rivlin also contributed to an additional proposal to address the nation's debt as co-chair of the Bipartisan Policy Center's Debt Reduction Task Force. *The Georgetown Public Policy Review* spoke with Alice Rivlin to discuss national security issues in the context of federal government reforms and fiscal sustainability.

GPPR: Right off the bat, thanks for all the work you've done coming up with solutions for the deficit and debt. As young people especially, we're certainly appreciative.

Alice Rivlin: Yes, you're the people who are going to benefit.

GPPR: Generally speaking, what kinds of things did you hope to accomplish by serving on the debt commissions?

I actually agreed to serve with my old friend, Pete Domenici, the former senator from New Mexico and chair the Bipartisan Policy's debt reduction group, before I knew about the president's commission. I agreed to do that because I feel really strongly that the rising debt is a threat to our future prosperity. We have to get on top of it, and only a bipartisan coalition can do that. Now clearly, it's got to be done by the political process, but we thought that a bipartisan group of leaders who

have cared about the budget in the past could show that a bipartisan solution was possible – that a group of people could work on this thing and find some things that they could agree on. So that was the genesis of the BPC.

GPPR: One of the big issues in the proposals is the need to cut discretionary spending, and obviously defense discretionary spending is a big part of that. How do you balance the need to cut spending and the role that defense spending plays, as it relates to national security?

Alice Rivlin: Well, I think one of the breakthroughs of recent conversations has been that defense spending is no longer a sacred cow. I think there is quite broad agreement that there is a lot of waste in the defense budget and significant numbers of very expensive weapons that the Defense Department doesn't even want, but which continue to be funded because of the job implications in different members' districts. Addressing that problem is difficult, but I think everybody thinks now that it's got to be addressed. There are too many defense contractors, and they're not all doing necessary things.

That said, I think the other thing that is part of the conversation now about defense is, "What should be our role in the world?" Are we trying to do too much? We've had experience now with invading other countries and trying to turn them into functioning democracies. It's not always very successful. Maybe we shouldn't be doing that. And the nature of the threat has changed. Much of our thinking

about defense was in terms of hostile nation-states, notably the Soviet Union, over a long period. Now, it's less obvious that the threat is hostile nation-states. It is terrorists and failed states. So, that takes a different kind of mindset and weaponry.

GPPR: One of the other things you proposed was having the president set an annual limit for war spending. Is there any risk that that would overly politicize war strategy?

Alice Rivlin: No, I don't think so. I think actually, it is a good thing to require the president to think about, "What do we need to fight this war?" Now, the argument has always been, "We can't tell until we get there, and we can't project very far in advance." But that's true of a lot of things. The requirement that the Defense Department at least try to project what the costs of the war are going to be over the next year or two seems to me, as a budgeteer, a perfectly sensible thing. They can always say, "We've gotten new information, and it's going to cost more or less." But, I think this is just an attempt to stop the funding of defense appropriations on a supplemental basis and not subjecting them to serious planning.

GPPR: You mentioned that the big threat to our national security from our debt is the risk of losing the confidence of some of our creditors and having capital flight to other places. However, the recent financial crisis was actually an instance where capital fled to the U.S. Does that lend credence to the idea that for

investment to leave America it would have to go somewhere else, and as yet, there aren't viable options that compare to American T-Bills?

Alice Rivlin: We'd like to think that, and we've thought it for a long time. But it's not obviously true. As Europe recovers, and as the emerging market nations do better and better, there are going to be a lot more alternatives. I don't think we can count on being the place in which everybody wants to park their money because it's safe, if it doesn't seem so safe. The problem is our debt projections are beginning to look a bit like Greece or Ireland. That doesn't mean that people will lose faith in us quickly, but if we don't do something, they will eventually.

Read the full text of the interview at www.gppreview.org.

RUDY DELEON
SENIOR VICE PRESIDENT OF
NATIONAL SECURITY AND
INTERNATIONAL POLICY AT THE
CENTER FOR AMERICAN PROGRESS
An Interview by Ingrid Stegemoeller

Rudy deLeon is the Senior Vice President of National Security and International Policy at the Center for American Progress in Washington, D.C. DeLeon has 25 years of government service that culminated with Senate-confirmed appointments in the Clinton Administration including undersecretary of the Air Force, undersecretary of defense for personnel and readiness, and deputy secretary of defense. Prior to joining the Center for American Progress, deLeon served as a senior vice president with the Boeing Company. DeLeon has received numerous awards, including the Defense Civilian Distinguished Service Award and the National Intelligence Distinguished Service Medal. He spoke with *the Review* about the tensions inherent in maintaining national security while preserving personal liberty.

GPPR: We're going to talk about the tension between liberty and security in a post 9-11 world. Could you start out by defining what you think of as liberty and what you think of as security?

Rudy deLeon: Liberty is embodied in the Bill of Rights in the Constitution. Freedom of speech, worship, assembly, the right to be accused publicly by those that are bringing a case against you, the Fourth Amendment, the Fifth Amendment, the right to a speedy trial, due process; all of those things are instrumental in terms of our liberty as Americans. It's the Bill of Rights that makes our Constitution unique. Many countries have tried to prescribe our legislative processes and our separation of powers. But it is the Bill of Rights that really makes our Constitution unique and embodies our liberty.

Now, the other piece is the security piece. The way I look at it is, the Bill of Rights describes our liberty, the Declaration of Independence promises to each of us life, liberty, and the pursuit of happiness. To the person who is going to their job at the World Trade Center, they know that their country will do reasonable things to prevent Al Qaeda from crashing a jet airliner into the World Trade Center. That person, or the bank worker, or the janitor, who goes to work at the World Trade Center knows that in one of our founding documents there is a commitment to life, liberty, and the pursuit of happiness. So there is a balance here between liberty and security. You've got the Bill of Rights, which protects our freedoms. On the security side the protection of life, from terrorism, from crime, these are all things that society expects. So that's the dynamic. It is to maintain our freedoms and liberties in America, and at the same time protect them from a 9-11 type of attack.

We haven't always got it right. And sometimes public opinion goes in the wrong direction. The incarceration of Japanese Americans during World War II was political fear more than a threat against the United States. So this is not the first time in history where we've had this tension.

GPPR: Before we discuss the government policies that address this tension, can you talk about your time at Boeing and how you saw private companies adjust to the post-9-11 security changes?

Rudy deLeon: At Boeing the challenge was how do you make an aircraft secure. Prior to 9-11, the strategy was always to negotiate with hijackers, try to get the plane safely on the ground and do reasonable things. After 9-11, those rules changed. There were a number of enhancements to the aircraft to secure the cockpit. The pilot knows that no matter what happens on the other side of the door, he can no longer open it even if it means the loss of life of one of his colleagues. All of the common sense rules on hijacking changed.

More interesting was the reengineering of our airports physically and psychologically. The physical reengineering of the airport was, how do we make sure that luggage that's going on the plane gets inspected, and then, how do we make sure that we're finding the clean-cut looking person who has got a box cutter hidden in something like a laptop computer.

Interestingly, the government learned lessons from Disney. Everybody who goes to Disney stands in long lines. So lines at airports became the issue. And what the data showed was that Americans would be willing to stand in long lines so long as the long lines were fair and that they had logic to them. So like those Disney lines, you know that if you wait in the line for 30 minutes, you'll get to the front and you'll get on the ride. As contrasted to the chaotic situation where everyone is pressing to get up front and it's not logical. There was a psychological reengineering of airports, so that's why the lines to get inspected getting on an airplane look

similar to the lines at Disney.

GPPR: In addition to reengineering our airports, the U.S. created a number of new policies to address national security. The Patriot Act is a big one. You were working in the administration just prior to the 9-11 attacks. Can you talk about any policies that were in the works during your time in the administration?

Rudy deLeon: I think what 9-11 and the Patriot Act changed were processes in place since the 1970s on how you would collect intelligence or information against a suspected foreign threat to the United States.

By the time 9-11 came there had been a revolution in communications technology. It used to be you had to make your phone call by putting a dime or a quarter into a pay phone and call, and everything was on landlines. Now, we don't put quarters in the pay phones. We do texting, we have one or two or three cell phones, or it's possible to get a cell phone card and use it for a week and throw it away and get another one. The technology of modern communications produced the Patriot Act.

There's always a right to self-defense. If the United States was going to be attacked by a particular threat, there is a legal right to protect the country and its citizens.

Previous Administrations used the Foreign Intelligence Surveillance Act to collect information against foreign targets that were potential threats to the United States. You do that to protect the country.

The Patriot Act became controversial because the Bush administration contended that if you were in pursuit of a suspect, you wouldn't have time to go to court. So you wouldn't use the process that is prescribed in the Fourth Amendment for search. That's where implementation of the Patriot Act started to generate controversy.

The Clinton administration certainly used all authorities to protect the country. The arrest of the millennium bomber in Vancouver, Washington in 2000¹, breaking up extremist groups in the mid-1990s, and the arrest of Timothy McVeigh after the Oklahoma City bombing case are all examples.

“There is a balance here between liberty and security. You've got the Bill of Rights, which protects our freedoms. On the security side the protection of life from terrorism, from crime, these are all things that society expects.”

GPPR: The Patriot Act did give the government some expanded abilities to pursue what they saw as threats to our safety. Can you talk about any other big pieces of that policy that you see as positive additions to our security policies? And what you see as the negatives?

Rudy deLeon: We talked about the Bill of Rights on one side and the Declaration of Independence promising life, liberty, and the pursuit of happiness on the other. We started

“The 2010 attempted bombing in Times Square was perpetrated by a U.S. citizen. Suddenly, the line, again, between the Bill of Rights, and life, liberty, and the pursuit of happiness started to cloud under the Patriot Act.”

to push those boundaries with the Patriot Act. The lines weren't quite as bright. One of the precepts that goes back to President Ford's tenure was that U.S. law enforcement would never use the intelligence community against U.S. citizens. But with 9-11, you had a cell of individuals in the United States who were communicating with others in the Middle East, in Pakistan in particular. How do you track those kinds of folks? So one of the provisions in the Patriot Act allows surveillance against suspected lone wolves. But that was a major change because you were using collection techniques for foreign intelligence within the United States.

The biggest controversy was opinions coming from the Justice Department justified by the Patriot Act that said because the administration deemed we were at war with terrorists you would not have to go to federal courts for legal authorities.

GPPR: Can you address more specifically some of the concerns about the government's ability to monitor people's activities?

Rudy deLeon: One of the questions is cell phone traffic from neighborhoods in Brooklyn, New York or Newark, New Jersey that is going to sites in

the Middle East. Now that could be an Arab American calling his mother, or it could be conspirators talking to each other. You don't know. And you don't know whose phone it is. Is it an American citizen? Is it someone who is legally in the country, or someone who is illegally in the country?

The 2010 attempted bombing in Times Square was perpetrated by a U.S. citizen². Suddenly the line, again, between the Bill of Rights, and life, liberty, and the pursuit of happiness started to cloud under the Patriot Act.

GPPR: Continuing along the lines of how new technology has affected this tension between liberty and security, and in light of the revolution in Egypt, can you talk about the importance of the government having the ability to influence heavily the Internet? For instance, can you address the Cyber Security and American Cyber Competitiveness Act of 2011?

Rudy deLeon: There are two ways to look at this. The first one is, does the president of the United States have some authority to do what the president of Egypt tried to do, which was shut down Facebook and Twitter, to prevent a peaceful protest on the streets? The technologies are too engrained in all of our daily lives that if anyone ever tried to do that, first, there would be huge protest, and second, most of our communications here in the U.S. – in particular new technologies – are in the private sector. As we saw in Egypt, these networks are considerably resilient. Maybe in Iran they could shut it down, but in

Egypt these are resilient technologies and if you block off one channel you can open them up in another area. So freedom of speech translates into access through all of the technologies of speech. The US has told the Chinese it's unacceptable for them to try to block communications, to restrict the Nobel Prize winner from communicating, and to shut down Google.

The cyber piece in the recent Cyber Security act is focused on how you protect institutions that rely on the Internet when the integrity and access to the Internet is critical. For instance, in a particular section of New York City; you have Internet pipelines that are covering four or five billion dollars in electronic financial transactions every hour. You have to protect those lines of communications from hackers, or people that would try to intercept or penetrate firewalls. Hollywood has had fun with these movies, where somebody gets the code and starts sending money from one account to another. The cyber statute is looking at how to protect critical infrastructure in the United States: the power grids are controlled by computers; banking is transacted by computers; when you buy something at the store and you give your credit card to buy that item, you expect a particular assurance that your credit card is not going to end up somewhere else. So as we go more and more to these new technologies, we all expect access. The challenge is to protect the security of something like the banking system and at the same time to protect the privacy of the email that you send your mother.

GPPR: Do you think this current act is one that will accomplish both of those goals?

Rudy deLeon: I think we are just getting into the world of electronic communications and how it is protected. Our laws are still set up for the time when you dropped a quarter into a pay phone. So moving all of the laws and statutory authority into the 21st century to match all of the capabilities that are possible with digital communications, I think that's the challenge. We're only starting that debate.

“Our laws are still set up for the time when you dropped a quarter into a pay phone. So moving all of the laws and statutory authority into the 21st century to match all of the capabilities that are possible with digital communications, I think that's the challenge.”

GPPR: Another issue that's come up is the Justice Department looking to Internet service providers to keep track of more information about what their customers are doing online. How do you see the Internet continuing to push these new policies, bringing older policies into the 21st century? Where do you see that going from here?

Rudy deLeon: You not only have to measure the content, you've got to measure the intent and the threat environment. If you are saying we need

to find out who in New Jersey or in New York City are communicating with these websites to locations in Pakistan or Yemen, yes.

Are they expressing their free speech and their rights to communicate and to associate, or are they plotting against the United States? The intention has to be looked at.

GPPR: How does a policy distinguish between harmless private communications and those with intent that could be damaging?

Rudy deLeon: What you're trying to do, again, is protect life, liberty and pursuit of happiness, and you're doing it against these Constitutional protections. So the key is to understand the Fourth and Fifth amendments and due process. As long as you are going into the courts to request authority, it's been possible to search a suspected house for evidence, you can put wiretaps on organized crime, and if the judge signs an order that this is permissible. We've been doing that on the law enforcement side for years. One of the challenges is to make sure that we've got due process as we use these tools to keep America safe.

GPPR: Where do you see the role of the government in terms of the Internet? We've talked about how a lot of communications are housed within private companies; they are the ones who dominate the communications industry. Do you see the government playing a more regulatory role with the Internet in the next 5 to 10 years, in terms of both national security and as a communications tool?

Rudy deLeon: Is there due process? If you're going to monitor someone, if you're going to use collection against someone for law enforcement or for intelligence purposes, are there legal mechanisms that are conducting rigorous oversight? What's the process? What are the intents that you're protecting and the threats you're trying to deal with?

GPPR: Can you talk about any major gaps that you see as particularly urgent in either protecting national security or protecting citizens' freedom and privacy?

Rudy deLeon: Let's start with the threats. What are the threats out there? First is the threat of terrorism, the fact that they're communicating on cell phones and email and websites. Second are hackers that are up to criminal activity. Finally, foreign governments that want to use the cyber world to collect sensitive intellectual property within the United States. Those are all things that need to be protected.

On the other hand, Americans, going back to their disagreements with the King of England, don't want the government looking over their shoulder, and don't want the government interfering in their business or invading their privacy.

ENDNOTES

1 Ahmed Ressay, an Al Qaeda operative, was arrested in December of 1999 before he could execute a plot to bomb the Los Angeles International Airport.

2 Faisal Shahzad—a naturalized U.S. citizen who is originally from Pakistan.

STEVE CLEMONS

FOREIGN POLICY ANALYST AND POLITICAL COMMENTATOR

An Interview by Jim Steiner

Steve Clemons is a foreign policy analyst and political commentator who is perhaps best known for running the foreign affairs blog *The Washington Note*. He serves as Senior Fellow & Director of the American Strategy Program for the New America Foundation—a nonprofit, nonpartisan public policy institute that invests in new thinkers and new ideas to address the next generation of challenges facing the United States. Clemons also works as the Director of the Japan Policy Research Institute, which performs policy research and education on Japan and the entire Pacific Rim, with the aim of advancing inter-societal understanding, regional reconciliation, and global justice. He discussed U.S. foreign policy and its implications for national security with the Review.

GPPR: Almost ten years have passed since the attacks of September 11, 2001 on the World Trade Center and the Pentagon, yet the war in Afghanistan rages on. What is the state of global terrorism today, nearly a decade after the attacks on 9/11?

Steve Clemons: It has evolved from having been a focused effort by a well-organized group of players – who were able to bring together highly educated but suicidal people to focus a sophisticated attack on the United States – to a much more diffuse global threat, where groups often self-select to attack people or institutions in various countries but are not necessarily trained by Al Qaeda. Al Qaeda to some degree has been contained – at least its highest level leadership has been contained – and held in an environment that has preempted its ability to pull off another 9/11-type thing.

The problem is that we have spent a lot of time going after actors on a stage and have not done as much to steal their audience. Terrorism is always trying to appeal to people in the world; to appear legitimate in their eyes by exploiting grievances. Their horrific acts are designed

to get popular support. We have to do more to undo the grievances that these terrorists have been able to ruthlessly exploit, and the state of that remains the same as it was in 2001. If anything it's become a bit worse. If you look at the fiscal year 2000 Department of Defense spending and you were to add each year by what inflation was and look what we have now spent on top of that since the 9/11 attacks, it is cumulatively 2.2 trillion dollars. For spending 2.2 trillion dollars, it's remarkable that Americans still don't feel safe, that we haven't really stolen the audience from terrorists, and we haven't really figured out a new system of security that would help us all—that would help the world—feel as if there were a more stable and safe equilibrium.

“Iraq punctured the mystique of America’s superpower status in the world. It demonstrated that there were military and intelligence limits to what we could do.”

GPPR: Have nine years of the War on Terror made the United States more secure or less secure?

Steve Clemons: I think it's a mixed bag. It was entirely appropriate to take on Al Qaeda wherever they are and to have invaded Afghanistan to depose the Taliban, who were giving safe haven to Al Qaeda. At the same time, our military footprint was huge and clunky and has inspired enemies. This has helped build a larger force of

enemies who fear American occupation in a kind of neo-colonial posture that the United States has had in the world lately, and I think we've been blind to that. And so, yes, we've knocked back and constrained a lot of the terrorist threat. But at the same time, we've created a new blowback against the United States and its interests. I think it's very much a mixed bag.

GPPR: Let's go back to the months and years immediately following the attacks (on the World Trade Center). What was the United States' biggest mistake after 9/11?

Steve Clemons: Diverting attention from Afghanistan and going into Iraq. Saddam Hussein was a ruthless dictator, but he was rational, self-serving, and self-interested. The dirty reality in the world today is that there are a lot of dictators and totalitarian regimes. There is no stock of power or amount of resources among the United States and its allies to transform the world, so you have to make decisions and be engaged with various other parts of the world. We had Saddam Hussein in a box, but our government so badly wanted to go to war with Saddam Hussein that it put together a false explanation that created doubt about America's intelligence and its ability to be smart in the field. We essentially put together a false brief on Iraq and where Saddam Hussein was to justify a war that took down a dictator, and made other nations think we might do the same thing to them. So rather than America being seen as the beacon on the hill, it made America look as if it was incredibly less capable than it

once was. Iraq punctured the mystique of America's superpower status in the world. It demonstrated that there were military and intelligence limits to what we could do.

Before this, most of the world was always impressed with how the United States seemed never to have any boundaries on its power, its ability to innovate, or its economy, but this is the era of limits. Whether it is our economy or our military, America has been showing repeated limits. This not only animates the pretensions and interests of our foes. Much more importantly, it positions our allies not to count on us as much anymore. Iraq was probably the greatest strategic mistake of the modern era for what it has done to undo America's prominent place in global affairs. We still will be important. But we've become the General Motors of countries in the world today—big, well-branded, sprawling—but not seemingly able to organize what we do that is positively contributing to or positively shaping the international system

GPPR: Where is the War on Terror going over the next ten years?

Steve Clemons: I don't like the term "War on Terror," because it's like a war on a tactic. I don't know where it is going, but if I were to advise the government on where our concerns about transnational terrorism need to go, it is that we need to disaggregate it – stop using it as a single basket in which to throw every movement with which we have a problem. Hamas and Hezbollah, which are well-organized

social movements that represent a number of constituencies in Palestine or in Lebanon are branded as terrorist organizations, but they are not Al Qaeda. Islamic jihad is much less dissuadable than elements of the Muslim Brotherhood. We tend to throw political Islam as a whole in that basket, and it is an incredible mistake. So my view is that we need to be disaggregating the worst groups.

We also do it with regard to the Taliban. When President Obama came in, they tried to be careful of mixing Al Qaeda and the Taliban in the same sentence. Now, Al Qaeda and its affiliates are the code language, when in fact, we are at war with the Taliban and Afghanistan. But because so many are intellectually sloppy and use the Taliban and Al Qaeda somewhat interchangeably, it makes one think you can't deal with the Taliban, or that you can't negotiate with or listen to them. You can't think about what their prerogatives are, which we may be able to deal with or not. If you are going to go to war with the Taliban, you are going to go to war with a significant proportion of the population of Afghanistan for all time. The Taliban is a large movement, and Al Qaeda is very small. So, I think that for the so-called "War on Terror" – even though I don't like the metaphor – to get smarter, it has to disaggregate these groups. It must become much more sophisticated at looking at what movements are going on where and not throw everything in one basket.

GPPR: Under what conditions can the United States declare victory in Afghanistan?

Steve Clemons: I think that the Americans can draw down to about thirty thousand troops, move them into the more stable regions of Afghanistan, and begin to reach out to some of the lieutenants or parts of the Taliban that would be willing to cut a deal on stability and some sort of responsible government to the degree we can preserve women's rights, or any of that. If human rights become part of it, that would be nice, but I don't think it can be the central focus of what we can do. You've got to figure out how you maintain some stability and control over some of the country – recognizing you can't deal with it all – and begin a reconciliation and negotiation strategy. Once you do that, then I think you declare victory and possibly consider further withdrawals.

GPPR: The US has spent billions of dollars on intelligence and has committed 100,000 troops to Afghanistan, yet we seem no closer to finding Osama bin Laden. President Obama has not mentioned his name once in either of his State of the Union addresses. How does bin Laden fit into our national security policy? Do we underestimate his influence, or is he no longer a factor?

Steve Clemons: I think Osama bin Laden is an important symbolic factor and it's embarrassing that the United States and its allies have not been able to get him, and it shows the incredible complexities of our relationship with Pakistan. It seems to me that a global, coordinated intelligence effort to get Osama bin Laden would be possible. Prince Turki bin Faisal, former Saudi

Ambassador to the United States, has proposed exactly this.

The key is Pakistan, where Osama bin Laden is probably hiding, and Pakistan is making an industry out of operating in many different shades of gray in this war. I mean, we're very clearly at war in Afghanistan with a group, the Taliban, who are allied with at least a portion of the national security establishment in Pakistan, which also is an ally [with the United States]. So this is very complex. Osama bin Laden matters, but I don't think he matters in the operational view. It matters a great deal whether or not groups continue to do things in his name if he's out there. And of course there always exists the possibility that he and Ayman al-Zawahiri and others could sit back and organize another highly sophisticated complex attack on some part of the world.

GPPR: So does this signify the end of the neoconservative notion that state sponsors of terrorism like Iran are more dangerous than groups without state sponsorship such as Al Qaeda, or would you reject that view?

Steve Clemons: I don't think they look at it as an either/or proposition. Neoconservatives look at Iran as quite dangerous, and they view non-state actor terrorist networks as quite dangerous. Neoconservatives tend to link them and think that Iran is the largest patron in the world of non-state terror networks. But it is not just terror networks – they're also patrons of sophisticated political movements that represent the anti-mainstream governments such as Hezbollah in

Lebanon or with Hamas in Palestine. And, of course, Iran is supportive of Syria, which is neither Hamas nor Hezbollah and frankly is non-Islamic. I mean, it's an Islamic country, but those controlling Syria are not part of those networks so it's not ideological. Iran is a much more shrewd and sophisticated manipulator of its interests – using different methodologies and different vehicles to push those interests – than the way most neoconservatives look at Iran. The neoconservatives are correct that there is more connection between these different kinds of groups than there should be. It also shows the failure of the United States to find ways to reach out to some of these groups as well who are only coordinating with Iran because they have no one else to go to. They would diversify their relationships to a degree if there were different options.

GPPR: What foreign country would you characterize as being the greatest threat to American national security today?

Steve Clemons: I think Pakistan is a very wobbly country and democracy with strong currents of a movement we're at war with. The country has nuclear weapons. It is extremely paranoid about India, and it has a political class and culture that looks at the flirtation with these non-state networks as giving them power. Actually, as we saw in the Laskar-e-Taiba attacks on Mumbai, Pakistan quietly endorses and empowers pretty horrific terrorism. That is dangerous to us on so many levels. It is dangerous because of the fault line with India.

It's dangerous because we are fighting an ally of Pakistan in Afghanistan. Afghanistan is a civil war which is also a proxy war between India and Pakistan – and we're caught in the middle of it. It's a mess. The chances of nukes and nuclear materials, triggers, and other paraphernalia falling into the hands of very bad people in the world are greater in Pakistan than they are anywhere else in the world.

I also think China is a threat, but not really a national security threat in the same sense as Pakistan. .

“The changes of nukes and nuclear materials, triggers and other paraphernalia, falling into the hands of very bad people are greater in Pakistan than they are anywhere else in the world.”

GPPR: One current narrative regarding Chinese-American relations is that the US, a waning superpower, is facing the ambitious surging power of the Chinese. The two nations have sparred over currency, human rights, global warming, international investment and trade, and nuclear weapons. Many see an inevitable collision of conflicting interests. Do you share that view, and what does the United States do about that?

Steve Clemons: No. China is a still a poor country. It is 100th in the world in per capita income. But it's the largest energy user in the

world and it's the fastest growing accumulator of power in the world. It is simultaneously working to get itself embedded in international institutions and occasionally trying to act like a responsible global stakeholder. On the other hand, it is an incredibly self-interested nation making bets and decisions to secure its long-term strategic resources – oil, energy – and move it around the world. China feels as if the West and the United States are occasionally trying to contain its growth. China is going to urbanize 300 million more people in the next fifteen to twenty years. It will be the biggest economic event going on in the world – and that will create all sorts of problems. But China is where the economy will grow. There will be environmental problems and governance problems. But China doesn't have the ability or the attention span to be a fundamental challenger to the United States in the international system other than preserving its prerogatives because it has so much internal instability to deal with.

It is a potential threat in the way America is seen in the world. It is not that I think that we are going to be going to war with China, but I also think China is the Google of countries. It's changing the way the global gravity of power is working in the world. China's rise combined with America's seeming stagnancy and inability to get itself out of some of these big problems is a national security problem because it means we have less muscle. There is less respect and less following of us when we want something because now

there's an appearance of an alternative network. That is a different kind of political and national security problem. But, the United States, rather than thinking it needs to or will collide with China, needs to find ways to continue to work in each of these areas of interest and concern.

GPPR: You recently described Israel as a “client-state” of the US. Where do they fit into our national security process going forward?

Steve Clemons: It's complicated. Israel is one of these nations where we suspend our normal process of thinking strategically and rather look at Israel through domestic political constituency lenses. I think that's wrong. Israel is a friend and ally of the United States. It should have security, and it is strategically significant to us in a complicated and tough neighborhood. But, I don't think its relationship with the United States is sacrosanct, and Israel has very fundamental responsibilities that it needs to maintain to keep our relationship healthy. I feel under the Netanyahu government of late, it hasn't been doing that. There is no relationship in the world that should be unconditional. And I absolutely think that Israel has been violating some conditions over the fundamental questions of what it does with this gray area of occupying Palestine illegally – by every measure: U.S. law; international law; the United Nations. Israel seems to want to fly in the face of that.

The Palestine state situation is a

national security interest to the United States now because it is one of the flaming grievances that is animating Muslim and Arab rage. They feel their lives and their nations are not as valuable to the West as Israel is. It is vital to move beyond that and to set up a framework and a foundation by which Israel can begin normalizing relations with its neighbors in the region and Arab and Muslim nations around the world, so that it can begin to have a conversation with its neighbors about mutual security interests like Iran, transnational terror networks, and others.

Establishing Palestine is something that's vital both to Israel's domestic interest, given the population dynamics that it has, and it's also vital to Israel in the fact that America's relationship with Israel is like a New Orleans levee. It's working today, but it's not getting better. It's eroding over time. So, I think that Israel is important to the United States, but under the current Israeli government the paralysis over Palestine is a very big drag on American power and American options, and it has to be resolved or contained.

The alternative is to put Palestine and Israel in a box and just stop tending to them. But the problem in this conflict continues to blow up and usually drags the United States and the rest of the world into it if it's not being tended, so it is one of the world's significant fault lines that needs to be addressed. We have an almost permanent Middle East business with permanent Middle East apparatchiks that continue to populate and rotate through this never

ending business. I think we need to put the "peace business" out of business and move into a different framework with a secure Israel and a resolved and established Palestinian state.

“China is the Google of countries. It's changing the way the global gravity of power is working.”

GPPR: The current events in Egypt and the rest of the Middle East seem to be leading to Obama's Mid-East moment of truth. What is the “Obama Doctrine” as you see it with respect to national security and foreign policy?

Steve Clemons: I don't know if Obama has a doctrine yet. The Obama doctrine is pragmatic. It is wanting to be supportive of democracy and universal rights. Recognizing issues about being able to eat and have a job and working in some of these horrible places toward a better future is something he feels governments have a responsibility to deal with. But I think he is also cognizant of the limits on American power right now, and I think he is aware you can't make foreign policy and move the world through platitudes. So, I don't know if Obama has a doctrine yet.

I wish he would step back given what we've seen unfold in Egypt and elsewhere in the Middle East and say, “We need a new strategy in the region that directly embraces the people more.” If anything, he tends to try to talk to publics more than most

presidents. He is not satisfied talking just to leaders, oil sheiks, and generals. There is an outreach to these publics – not to undermine dictators per se, as I think might have been the goal of President Bush before him – but more to have a conversation about what the world ought to be and their responsibilities out there in trying to achieve it. In that sense, I think Obama is very inspirational. But from a pragmatic realpolitik point of view, he recognizes we can't just wave a magic wand, get rid of these dictators, and just pretend to be in a world we are not. We're going to have a mixed bag. We're going to have some places where we deal with dictators and totalitarian regimes, and that's the way it's going to be because there is no fundamental insurrection by those people to redirect their governments. And then we are going to have times where there is change.

To some degree, the United States needs to reconfigure what its concerns in the world are and how it is going to achieve these interests in a world without equilibrium which is constantly in flux, and we are not there yet in understanding what that will look like.

GPPR: I am going to ask you to make a prediction – do you foresee a major terror event happening on American soil during Obama's presidency, and if so, what would it look like?

Steve Clemons: I don't know. It's a hypothetical. I think the chances of another terror attack on this country are relatively high, but not knowing

what it will look like or when. We have tons of vulnerabilities. There are power plants, hazardous materials and more than enough incendiary capability inside this country for people inside this country to attack. It seems to me there are enough crazy people or motivated people who have causes that something could happen. But I don't know if it will happen under Obama or someone else. I think that overall our embedded sensors – our antennae about what is happening – tend to be better than they were before 9/11, and the aggregate intelligence is more significant. But most of the stuff that we catch – like putting a car bomb in Times Square – is often luck and just greater vigilance. I think vigilance is rather high today, but I worry [about] vigilance decreasing here in the US.

I worry a lot about Americans who identify with Islamic extremism – folks who have the capacity to create mass casualty events. I worry a lot more about Americans who want to make it look like Islamic extremism. I think we have people out there who see their political benefit and situation rising the more high fear architecture they're able to create. That is a bigger issue because we have people inside this country with a vested interest in scaring Americans, and who want more power in the political establishment. And that scares me.

THE FINANCIERS OF TERRORISM:

Evolving Support Networks and the American Response

By: Andrew Q. Eck

Andrew Q. Eck serves as a legislative assistant in the United States Senate and is a Ph.D. student in the School of Public Policy at George Mason University.

The United States government has greatly increased its role in the suppression of terrorist financing in the years since the attacks of September 11, 2001. Following the attacks on the homeland, American government officials detected and froze the assets of terrorist groups and their sympathizers, enacted legislation to better monitor and secure the formal financial system, and partnered with international allies to curtail the flow of money through terrorist financing networks. In the years since, terrorist groups and their support networks have adopted new methods of raising and transferring funds. American officials are now working with foreign counterparts to reduce the threat posed by the financiers of terrorism and adapting to the altering methods utilized by terrorist financiers to transfer assets to terrorist operators in the field.

INTRODUCTION

In the aftermath of the terrorist attacks upon the United States on September 11, 2001, the American government undertook an unprecedented effort to locate and restrict the financial accounts of terrorist organizations and their sympathizers. Prior to the attacks on the homeland, the United States government and its international allies were not as centrally-focused on the fundraising and asset transfer aspects of terrorism as they are today. As two former officials within the Treasury Department's Office of Terrorism and Financial Intelligence noted,

In the wake of the attacks, the United States dramatically heightened its focus on combating terrorist financing, employing an aggressive, multifaceted response in which it designated and froze the assets of numerous terrorist financiers and support networks, prosecuted individuals and entities for providing material support, and increased its focus on 'following the money' (Levitt and Jacobson 2008, 1).

Since the attacks, the United States government has made great strides in locating and destabilizing terrorist financing networks. The Treasury Department, along with other member agencies of the United States Intelligence Community (IC), has increasingly targeted the bank accounts of suspected terrorists and their sympathizers, created designation lists to warn financial institutions and businesses not to deal with these individuals and groups, and worked with the United Nations and foreign allies to suppress illicit international asset transfers. As then-Under Secretary of the Treasury for Terrorism and Financial Intelligence Stuart Levey testified before the Senate Committee on Finance:

We have a Treasury Department that is playing a greater role in national security than ever before ... The Treasury is well-suited to address [the threats] because of the authorities we command, the relationships we possess with governments and private sector actors around the world, and the financial information we can draw upon (2008, 2).

Al Qaeda leadership relied on formal and informal financial systems to transfer funds to individual hijackers in preparation for the attacks on September 11, 2001. As referenced in the National Commission on Terrorist Attacks Upon the United States' *Monograph on Terrorist Financing*, "The plot cost al Qaeda somewhere in the range of \$400,000-500,000, of which approximately \$300,000 passed

through the hijackers' bank accounts in the United States" (Roth et al. 2004, 3). Following the attacks, the American government undertook efforts to follow the money trails of the terrorists and their financiers, through the formal international banking system as well as informal methods of asset transfer. The government's investigations resulted in the implementation of policies to strengthen the ability of the domestic financial system to better monitor suspicious activity. In reaction, terrorist groups and their sympathizers have adopted new methods of fundraising and transferring assets. As the United States government makes it more difficult for terrorist groups to operate and support their infrastructure, these organizations and their financiers alter their methods in attempts to remain outside the scrutiny of the IC.

While governments will never be able to eliminate the threat posed by the financing of terrorism, officials continue to adapt to the changing methods of fundraising and transfer systems utilized by terrorist groups. For example, the United States Department of State issued a report citing the increased use of "new payment methods' or NPMs, also called 'e-money' or 'digital cash.' Examples include Internet payment services, prepaid calling and credit cards, digital precious metals, electronic purses, and mobile payments or 'm-payments'" (United States Department of State 2008). These new forms of asset transfer provide terrorist financiers with expeditious methods to send funds to terrorist actors without

alerting the authorities to suspicious activity.

Whereas the attacks of September 11, 2001 were expensive and culminated from the result of extensive planning, other recent terrorist attacks have cost much less, relied on fewer actors, and had less oversight. The United Nations' Analytical Support and Sanctions Monitoring Team reported that the twin attacks on the American embassies in Africa, the attack on the USS *Cole* in Yemen, the Bali nightclub bombings, and the Madrid train attacks each cost less than \$50,000 (2004, 12). Similarly, it has been reported that the failed Times Square car bomber, Faisal Shahzad, received \$12,000 to plan and execute his attack (Perez 2010) and Al Qaeda in the Arabian Peninsula (AQAP) claims the attempted UPS plane bombing had "a total bill of \$4,200" (*Inspire Magazine* 2010, 15).

The director of the National Counterterrorism Center recently testified before the Senate Homeland Security Committee that, "the impact of the attempted attacks during the past year suggests al-Qa'ida, and its affiliates and allies, will attempt to conduct smaller-scale attacks targeting the Homeland but with greater frequency" (Leiter 2010, 2). As the American government has made it more complicated for terrorist groups to successfully execute large-scale attacks like those that occurred on September 11, 2001, terrorist entities have turned their attention to smaller, less expensive, and more individualistic operations, which are in turn less reliant on the formal banking system

and more difficult to monitor.

Throughout this essay, I will address the evolution of methods utilized by terrorist financiers to raise and transfer funds to terrorist groups worldwide. I will also examine practices implemented by the United States government to curtail the financing of terrorism. Additionally, I will discuss partnerships that have developed between the United States and foreign governments to address the issue of terrorist financing in an age of smaller-scale and homegrown operations. As terrorist operations have become smaller, reliant on fewer actors, and less expensive, terrorist financiers have in turn modified their methods of funneling assets to terrorist operators in the field that are less detectable to authorities and result in fewer records and financial footprints.

METHODS USED IN THE FINANCING OF TERRORISM AND THE AMERICAN RESPONSE

Terrorist financing is the aggregate of the various tools, methods, actors, and networks that operate together to raise money and transfer assets to support the operations and infrastructure of terrorist organizations worldwide. Broken into two components, the financing of terrorism relies upon fundraising and asset transfer. The fundraising aspect of terrorist financing includes a multitude of methods: some are illicit in nature and overtly in support of terrorism, while others are more ambiguous and may rely on unknowing individuals contributing

funds. As a report published by the Council on Foreign Relations describes,

Al-Qaeda's global fund-raising network is built upon a foundation of charities, nongovernmental organizations, mosques, websites, intermediaries, facilitators, and banks and other financial institutions. Some whose donations go to al-Qaeda know full well the violent purposes their money will further. In other cases, donors believe their money will help fund legitimate humanitarian efforts, but the money is nonetheless diverted to al-Qaeda. For years, individuals and charities based in Saudi Arabia have been the most important source of funds for al-Qaeda (Greenberg et al. 2002, 1).

In addition to the raising of funds through charities, the Internet, and individual financiers, terrorist financiers must in turn transfer these funds to actors in the field. Means of transferring assets to terrorist organizations have included making use of the formal international banking system, relationship-based methods of asset transfer such as hawala and couriers, cash smuggling, and various electronic transfer methods over the Internet.

The funds associated with terrorist financing are essential for the continued operation of terror groups, not simply for the direct costs associated with a particular attack. "Recruiting, training, traveling, planning operations, bribing corrupt officials, and other such activities also cost money" (Levitt and Jacobson

2008, 3). While individual terrorist operations can be executed on relatively small sums of money, as shown by the costs associated with recent successful and attempted attacks, terrorist organizations rely heavily on financing to support their infrastructure and fund the indirect costs associated with terrorist operations. "At a minimum, tracking terrorists' financial transactions will make it harder for them to travel, procure materials, provide for their families, and radicalize others. Denying terrorists – as well as insurgents and proliferators – easy access to financial tools forces them to use more costly, less efficient, and often less reliable means of financing" (Levitt and Jacobson 2008, 6).

Even though it is impossible to entirely eliminate terrorist fundraising and transfers of assets, the American government's and its allies' work to reduce the flow of money to terrorist groups can make it more difficult and more expensive for them to operate. "The repeated pleas for money from al Qaeda leaders over the last year are seen as evidence the group is desperate for funding and that it has gotten more difficult for operatives to grease the right palms along the way" (Vardi 2010).

In the years since 2001, the American government has enacted legislation, produced executive orders, and created new, high-level offices with the responsibility of monitoring and gathering intelligence on terrorist financing networks, and suppressing them. One of the most significant

actions taken by the government in the wake of September 11, 2001, was the signing of Executive Order 13224 on September 23, 2001. With this order, President George W. Bush authorized “the U.S. government to designate and block the assets of foreign individuals and entities that commit, or pose a significant risk of committing, acts of terrorism ... [and] to block the assets of individuals and entities that provide support, services, or assistance to, or otherwise associate with, terrorists and terrorist organizations designated under the Order” (United States Department of State 2001).

In addition to executive powers, the United States Congress passed the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT) Act, which was signed into law on October 26, 2001. Title III of the law deals with terrorist financing by strengthening penalties for financial crimes and providing officials with more tools to disrupt terrorist financing networks. Levey, in testimony before the Senate Committee on Finance, said that title III of the USA PATRIOT Act “is an important and extraordinarily useful tool ... [that] allows us to finely target our actions so that we can protect the threat that an individual financial institution poses” (2008, 14-15).

Officials at the Treasury Department utilized Section 311 of the PATRIOT Act against Banco Delta Asia (BDA) to “prohibit all U.S. financial institutions from maintaining correspondent accounts for BDA and prevent BDA

from accessing the U.S. financial system, either directly or indirectly ... BDA allowed its North Korean clients to use the bank to facilitate illicit conduct and engage in deceptive financial practices” (Levey 2007). This sanction demonstrates the authorities provided for under the PATRIOT Act and expresses the ways in which the American government can isolate illicit financial actors and preclude them from further engagement in the American banking system.

While individual terrorist operations can be executed on relatively small sums of money ... terrorist organizations rely heavily on financing to support their infrastructure and fund the indirect costs associated with terrorist operations.

The Treasury Department also utilized powers under Section 311 to classify the Lebanese Canadian Bank (LCB) as a financial institution engaged in money laundering and narcotics trafficking. The Treasury Department linked LCB to Hizballah and officials stated that the bank failed “to adequately control transactions that are highly vulnerable to criminal exploitation, including cash deposits and cross-border wire transfers; inadequate due diligence on high-risk customers ... and complicity in the laundering activity” (United States Department of the Treasury 2011).

It is evident through these actions

taken by foreign governments and banking institutions that the United States government has been successful in reducing the flow of funds to terrorist groups and rogue states through the international formal banking system. The American government has worked with foreign counterparts to reduce the footprint these illicit actors have around the world. However, terrorists and their financiers have modified their methods over the years in response to American counterterrorism policies. As the formal banking system has become more guarded and protected against terrorist financing, these terrorist facilitators have altered their techniques to include more low-tech, decentralized, and cash-based systems for transferring funds to terror groups. The following section explores how the network structure and financing methods have evolved over the decade.

EVOLVING NETWORK STRUCTURE AND NEW METHODS OF FINANCING

Terrorist groups, as with any illicit network, rely inherently on trust between members. As opposed to formal hierarchies, networks, including terrorist financing networks, “tend to be based on direct personal contacts ... often composed of members with similar professional backgrounds, interests, goals, and values” (Eilstrup-Sangiovanni and Jones 2008, 12). This is particularly pertinent to the structure of Al Qaeda, which has evolved from a hierarchical organization under the leadership of Osama bin Laden, “into

a global jihad movement increasingly consisting of associate groups and ad hoc cells all over the world” (Eilstrup-Sangiovanni and Jones 2008, 34).

In the years since 2001, Al Qaeda has focused more on smaller attacks and less on larger, more coordinated operations. “The al-Qaeda that perpetrated the September 11, 2001, attacks was not really organized as a network. Indeed, many of al-Qaeda’s traditional strengths seem to build on a hierarchal structure, which has been increasingly difficult to sustain as the organization has come under stress ... it appears to be losing unity, cohesion” (Eilstrup-Sangiovanni and Jones 2008, 34).

The evolving structure of Al Qaeda demonstrates that as the organization loses its hierarchical structure, it depends more upon independent and homegrown terrorists. “Since 2001, terrorist actions linked to jihadist groups have nearly all been aimed at soft (nongovernmental) targets, and all appear to have been initiated by local groups with scant involvement by the al-Qaeda leadership” (Eilstrup-Sangiovanni and Jones 2008, 41).

Similar to how the Al Qaeda organizational structure has modified into a network system of local actors and homegrown radicals concentrating on smaller scale and less expensive operations, terrorist financing networks have also altered the ways in which they raise and transfer funds to actors in the field. As the international formal banking system has been strengthened by counterterrorism officials, terrorist

financiers have moved into more relationship-based, off-the-grid systems of value transfer.

A Government Accountability Office (GAO) report describes the shift in terrorist financing methods following the attacks of September 11, 2001. The PATRIOT Act “expanded the ability of law enforcement and intelligence agencies to access and share financial information regarding terrorist investigations. As initial U.S. and foreign government deterrence efforts focused on terrorists’ use of the formal banking or mainstream financial system, terrorists may have been forced to increase their use of various alternative financing mechanisms” (United States Government Accountability Office 2003, 1).

The assistant attorney general for national security, David Kris, stated, “terrorist organizations and their financial supporters are exploiting hawalas and other money remitting businesses in this country to move funds quickly, cheaply, and internationally” (Perez 2010). In addition to informal and often unregulated money transfer systems such as hawalas, it was noted in an essay in *The Economist* (2005) that, “credit-card fraud, welfare fraud and smuggling are some of the other known sources of funds for terrorists activities ... [as well as the] funds [derived] from cigarette smuggling.” Specifically relating to such criminal enterprises used to finance terrorism, the United Nations valued the illicit cigarette market at \$4 billion, in addition to “the unpaid taxes and customs duties, which

can add an additional \$5 to \$10 billion in profits for cigarette traffickers” (Shelley and Melzer 2008, 1-2).

The Financial Action Task Force issued a report that described evolving forms of asset transfer employed by terrorist financiers to include, “cash, internet-based systems and new payment methods ... wire transfers, and trade-based transactions, often involving the use of false or stolen identities” (2010, 59). These forms of moving funds from one location to another are much more difficult for law enforcement and intelligence services to track due to fewer regulations and less transparency as compared to the formal financial system.

As the international formal banking system has been strengthened by counterterrorism officials, terrorist financiers have moved into more relationship-based, off-the-grid systems of value transfer.

The secretary general of INTERPOL, Ronald K. Noble, testified before the House Committee on Foreign Affairs, saying terrorist financiers engage in the trade of counterfeit goods such as “CDs, DVDs, clothes, shoes, cigarettes and computer software” (2003, 14). These items depict the nexus between terrorist financing and criminal enterprises, in which terrorist groups are now raising and transferring funds through illicit activities as opposed to the more traditional, formal banking mechanisms.

Michael Jacobson, a former official within the Treasury Department's Office of Terrorism and Financial Intelligence, wrote that Al Qaeda and other terrorist groups have "relied on the internet to spread its message and ... raise and transfer needed funds to support their activities" (2009, 17). Jacobson cites the practice of terrorist financiers using stolen credit card numbers to launder "money through a number of online gambling sites" (2009, 18). The size and scope of the Internet, and the anonymity it provides, allows terrorist financiers to raise and transfer money more stealthily than through bank accounts and formal financial transactions. In addition to Internet-based systems, "transactions can also be conducted through cell phones in what are now better known as 'M-payments'" (Jacobson 2009, 19).

The Internet provides terrorist financiers with "an anonymous, largely unregulated, and geographically unbounded [arena which] ... has created unprecedented opportunities for fraud, money laundering, and the provision of material support to terrorists and terrorists organizations" (Department of the Treasury 2003, 54). The openness and ease of use of the Internet allows terrorist financiers to "solicit donations ... exploit charitable donations ... perpetrate online crimes ... [and serve as a means] of communication to organize and implement other fund raising activities" (Department of the Treasury 2003, 56). The Internet will continue to be a useful tool in the terrorist

financier's cache, and a policy field that American officials must address, while weighing privacy and civil liberties concerns with safety and security.

The Department of State reported about the evolving methods of terrorist financing, noting that financiers are utilizing "low-tech, but highly effective ways ... [such as] bulk cash smuggling and trade-based money laundering ... [and] a plethora of new, high-tech value transfer systems that can be abused" (2008). M-payment systems provide one of the latest methods for transferring money among various people without the use of the formal financial system. "Proceeds of crime or contributions to terrorist organizations can now be transferred via cell phones. With such transfers, criminals avoid the risk of physical cash movement, bypass financial transparency reporting requirements, and rapidly send digital value across a country or around the world" (United States Department of State 2008).

CONCLUSION

Following the terrorist attacks of September 11, 2001, the United States government tracked the terrorists' money trail through the international banking system, thus discovering the connections between the perpetrators of the attacks, their financiers, and the various sources of fundraising. American officials froze the bank accounts of terrorist organizations and their sympathizers and the government enacted legislation and executive orders to better combat

the threat of terrorist financing. As a result, the financial system is now more transparent, designation lists have been created to alert international banks and governments to terrorist entities and their supporters, and the Treasury Department is increasing partnerships with international allies to suppress terrorist financing activities

As this method of transferring funds from one locale to another has become more secure, terrorist groups and their financiers have altered their methods to include lower-tech, relationship and cash-based systems, and criminal endeavors to raise and move money. Practices such as using prepaid debit cards, stealing credit card information, smuggling, hawala asset transfer networks, and various Internet-based systems have provided terrorists with many new, and less detectable, sources to raise and transfer assets worldwide in support of terrorist activity.

Resulting from increased security and intelligence gathering procedures, the threat posed to the United States from another 9/11 style attack has decreased. However, as counterterrorism officials have noted, smaller-scale attacks such as the attempted Times Square bombing and the attempted UPS plane bombing are on the rise and are expected to remain a concern in the future. These forms of terrorist operations can have vast consequences from minimal investments in planning and manpower.

To continue to protect the citizens of the United States, government officials must be able to adapt to the changing

methods utilized by terrorist financiers. The government's success in better securing and monitoring the formal financial system has led terrorist groups to less regulated sources of fundraising and asset transfer.

The United States government should address the threat posed by terrorist financiers on all fronts. As Treasury Department officials have done recently with great success, government officials should regularly meet with foreign counterparts to explain the mutual benefit to reducing the spread of illicit finance. Working together with international counterparts is the most effective way to follow the money and suppress the financing of non-state actors with global reach.

Within the formal financial system, though it has become more secure over the years, practitioners of illicit finance may still transfer funds under \$10,000 before financial institutions are required to file a Currency Transaction Report (CTR) (United States Department of the Treasury 2002, 6). In addition, financial institutions are required to file a Suspicious Activity Report (SAR) when a transaction exceeds \$2,000 for in-person transactions and \$5,000 for others (Internal Revenue Service 2010). By allowing government officials to monitor financial activity under these levels, they would be able to better detect suspicious activity and understand more about the total number of transactions going to and from particular locations, especially as recent attacks and attempted attacks have cost such low sums of money.

Outside of the formal financial system, it is important for American officials to continue to work with international counterparts to better regulate and monitor hawala asset transfer systems. While hawalas are largely unregulated and are based upon trust and relationships among the participants, working with foreign government to better maintain records of this financial activity could prove to be beneficial when compared to key terrorist and financier designation lists. In the event that American officials determine terrorist funds were routed through such hawalas, 311 sanctions and other isolating actions should be taken against hawaladars and their correspondent banks.

Finally, in addition to the formal and informal methods of asset transfer, it is important that government officials in various agencies work together to realize the nexus between criminal activity and terrorist financing methods. As smuggling, counterfeiting, and other criminal acts are being utilized at an increasing rate as methods to raise and transfer funds to terrorist organizations, collaboration throughout the government, as well as with foreign counterparts, aids in connecting the various actors and key nodes within terrorist financing networks.

The United States government has been successful in reducing the flow of illicit assets through the formal banking system in the years since 9/11. In addition, officials have worked well with allies to suppress terrorist financing operations worldwide. As

achievements have been made in the endeavor to curtail terrorist financing networks, these illicit organizations and their financiers have adopted new methods to raise and transfer funds. The increased use of Internet-based financial transfer systems, mobile payments, and criminal activity has changed the environment of terrorist financing. Furthermore, terrorist attacks have become smaller and less expensive, relying on fewer actors and less capital to execute operations. The American government continues its mission to restrict the flow of funds to terrorist operators and these officials should be given all the tools necessary to successfully protect the people of the United States from further aggression by terrorist entities.

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ADVANCING THE EFFICIENT FRONTIER IN CLEAN ENERGY:

Innovative Public-Private Investment Partnerships

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There is a widely recognized need for substantially higher levels of investment in clean energy technologies, both in developed and developing countries. Governments alone cannot provide the direct financing to reach the target investment levels required for the expansion of clean energy, yet it is also clear that the private sector, unaided, will not generate the required levels of investment due to the risk-reward profile of such investments. This article aims to advance the design and implementation of innovative public-private investment partnerships in clean energy, examining how such public-private partnerships (PPPs) can provide incentives and risk allocation systems that can enable significant increases in clean energy investments. Ultimately, these new investment vehicles could trigger the rapid and sustainable expansion of clean energy technologies, and would make valuable contributions to larger policy goals of energy security and climate change stabilization.

CLEAN ENERGY, CLIMATE CHANGE, ENERGY DIVERSITY, AND NATIONAL SECURITY: CONVERGENT OBJECTIVES

There is increasingly wide recognition in both developed and developing countries of the economic and strategic importance of accelerating the development of commercially viable clean energy sources. There are multiple reasons for the increasing importance of clean energy relative to conventional energy sources: national security concerns centering on energy diversification, energy independence, and reducing reliance on foreign fossil fuels; the economic growth and domestic employment creation that is expected to follow the faster

expansion of clean energy industries; and serious environmental risks posed by fossil fuel energy sources, including the threat of global climate change.

The threat of global climate change is a pressing item on the international development policy agenda. There is strong scientific consensus on the link between the increasing atmospheric levels of man-made greenhouse gas (GHG) emissions and the resulting long-term risk of dangerous global climate change. Scientific consensus among most climate science experts – and certainly the UN Framework Convention on Climate Change – remains fairly robust, despite the recent “Climate Gate” e-mail scandals suggesting unethical practices among some in the climate science community. There is a persistent gap between expert opinion and popular opinion on climate change however, particularly in the U.S., where the climate change issue has become heavily politicized (*The Economist* 2009). This has led to major national, regional, and international policy initiatives to reduce the levels of GHG emissions, both domestically and on regional and global scales. One element of reducing GHG emissions is limiting reliance on conventional fossil fuel sources of energy, which are a principal source of such emissions.

FINANCING DEFICITS IN CLEAN ENERGY INVESTMENT

Major near and medium-term increases in investments in climate

change mitigation and climate adaptation technologies are forecast by international expert bodies as necessary to move to desired low-carbon paths to growth. The International Energy Agency (IEA) estimates \$10.5 trillion in total global investments are needed to reduce GHG concentrations in the atmosphere to 450 ppm (parts per million) by 2030, which is expected to prevent world temperatures rising by more than two degrees Celsius (IEA 2009). While major increases in investment in climate change mitigation are necessary in both rich nations and poor countries, the financing needs are particularly acute in developing countries. Of the global total, the World Bank estimates public and private annual investment levels that will be required in climate change mitigation in developing countries at \$400 billion a year over the next 20 years (World Bank 2010). By comparison, total global energy subsidies in 2007 were estimated at \$300 billion (UNEP 2009).

DELAYS IN THE EMERGENCE OF CARBON PRICING

If intergovernmental negotiations succeed in creating a viable, robust future international carbon market or other scheme for pricing the externality of high-carbon energy sources, it would create substantial private financial flows toward investments in emissions reduction. After the recent Copenhagen and Cancun rounds of the UNFCCC process, the development of a carbon pricing scheme appears doubtful in the near to medium term. Even on the

optimistic assumption that a carbon market is established in the near term on national or regional levels, carbon market finance is widely expected to take considerable time to scale up to reach the volumes necessary. Carbon markets are clearly a critical element of policy frameworks to shift to clean energy, but they alone will not generate the required investments in mitigation technologies within the time frames forecast as advisable to control climate change risks (LSE Grantham Institute 2009; UNEP 2009).

FINDING POLICY INSTRUMENTS TO INCREASE INVESTMENT IN CLEAN ENERGY

For investment to rapidly increase in the near term, policy solutions are necessary to bridge the clean energy financing deficit. Multiple potential climate-focused international funding mechanisms are currently under consideration, most of which would channel primarily or exclusively public capital through intergovernmental transfers.

Private sector capital could provide most of the projected financing deficit for investments in climate change-related mitigation projects and assets in both developed and developing countries. Global private capital investments in clean energy (which reaches a broad range of technologies at various stages of maturation and commercialization) have generally increased over recent years, with the estimate for 2010 at over \$250 billion¹

(New Energy Finance 2009). Yet current and projected levels of private international investment in clean energy are far below the level needed for large-scale, rapid transition to low-carbon paths to growth.

Private sector investors in this and in other markets seek to earn competitive risk-adjusted returns. A central barrier to increased private investment is the limited expected returns on low-carbon investments in many developing countries, in relation to the high levels of risk faced. While the future growth of emissions trading markets and carbon offset mechanisms will increase the levels of private finance by providing new revenue streams for climate projects, they will have a delayed effect and are insufficient in expected magnitude to alone generate the investment required in the near and medium term (UNEP 2009).

The majority of the \$400 billion in estimated financing in developing countries' climate mitigation needs must therefore be provided by the private sector. Climate change mitigation as used in the climate policy literature often encompasses activities in three distinct categories: 1) expansion of clean (low-carbon) energy generation; 2) increased energy efficiency; and 3) sustainable forestry (World Bank 2010).

This article focuses on instruments to promote investment in the first category, which is the most capital-intensive. If current trends continue, the private sector will not generate anything close to this volume

of investment, based on market perceptions of the projected risk-reward frontier under business-as-usual conditions for such investments. There are multiple sources of market failures and inefficiencies which result in weak incentives for private sector investors and firms to allocate capital towards climate change mitigation. These include: environmental market failures and externalities, technology market inefficiencies, and finance market barriers (LSE Grantham Institute 2009). Equally important, it is increasingly clear that effective responses to climate change face stubborn policy failures at national and international levels, with many developed and developing nations proving unable to create: 1) policies promoting sustainable expansion of clean energy technologies, and 2) effective regulatory frameworks for reducing greenhouse gas emissions.

Innovative public/private investment partnerships could be designed to address key sources of the finance market failures preventing large-scale increases in investment in clean energy. Such partnerships are only one element of the total solution to the converging goals of clean energy expansion and climate change mitigation, which will require additional national and international policy responses – most importantly, the establishment of a viable carbon market regulating GHG emissions. Full discussion of the range of the other market and policy failures and the related possible responses are beyond the scope of this paper.

PUBLIC FINANCE MECHANISMS TO MOBILIZE PRIVATE CAPITAL

Increasing clean energy investment and climate change stabilization clearly call for concerted policy responses on multiple levels that coordinate public sector and private sector resources and actions. In the finance and investment area, policy strategies are needed to better allocate and mitigate risks, strengthen and align incentives among the public and private sectors, and create an enabling environment for sustained investment flows to clean energy. A range of public finance mechanisms (PFMs) has been successfully used to enhance the risk-reward frontiers for private sector investment in diverse target areas which governments have identified as receiving inadequate investment from private and/or public sources. PFMs have been used in fields including urban housing, defense, basic scientific research, and infrastructure development. Recently, PFMs operating at national or regional levels have begun to target areas such as renewable energy and energy efficiency. Conventional PFMs include grants, concessional debt finance, subsidies, risk mitigation, partial or total loan guarantees, and market aggregation activities (UNEP 2009).

Multilateral public-private financing mechanisms could in theory catalyze large volumes of private investment in evolving clean energy sectors. Recent empirical research on case studies of PFMs already operating in the climate change sector suggests that, when

effectively designed, PFMs can raise from \$3 to \$15 in private capital for each dollar of public capital committed through the PFM.² Particularly given the large and increasing fiscal deficits in many developed countries, PFMs can be powerful instruments to maximize the efficiency and effectiveness of scarce public funds invested in clean energy. The ratio of private to public capital for an effective PFM can range from 3:1 to 15:1 (UNEP 2009). Based on this data³, effectively targeted PFMs could generate a combined volume of public and private capital that could fulfill the required massive increases in investment in clean energy in developing countries, as highlighted in a recent report by the United Nations Environment Program, the UK Department for International Development, and private sector institutional investors (UNEP 2009).

This paper examines selected alternative approaches for new policy mechanisms aimed at mobilizing public and private capital for such investments. It recommends launching hybrid public-private investment partnerships targeting clean energy projects at intermediate to mature stages of commercial maturity. This recommendation is based on hybrid equity funds' rich potential to raise and efficiently manage large volumes of both equity and debt capital, find and execute successful investments, build experience in the target sector among key market actors, and accelerate the viability of the target clean energy markets for external investors.

Crucial factors driving the success of public/private investment funds will be the capacity to effectively allocate risks and align incentives among relevant public and private sector actors. Importantly, hybrid funds may have the greatest potential to achieve synergies from its diverse members' complementary public and private resources.

The diverse range of technologies included in the clean energy space demonstrates various stages of maturity and a broad spectrum of risk-return profiles. Accordingly, they attract different sources of finance. Applying a model of technology development widely used in clean energy and other areas, the four primary stages of technology growth are: 1) Early R&D and Proof of Concept; 2) Demonstration and Scale-Up; 3) Commercial Deployment; 4) Diffusion and Maturity (WEF 2010). There are some technologies that are generally viewed as likely to yield reasonable returns, assuming a favorable regulatory and policy environment (e.g. offshore and onshore wind power). Other technologies are at the early R&D stage or at the early demonstration stage (e.g. next-generation solar) and are far riskier as investments.

Hybrid public/private equity funds will have relatively broad market reach within these stages, extending from the intermediate stages of Demonstration and Scale-Up and Commercial Deployment up to the later stage of Diffusion and Maturity. Key potential

clean energy technologies suitably falling within these stages include (at increasing levels of maturity): solar thermal electricity generation; offshore wind power, enhanced geothermal power, smart power grids, solar photovoltaic power, large-scale hydro, and traditional geothermal power.

CRITERIA FOR ASSESSING POLICY INSTRUMENTS TO INCREASE CLEAN ENERGY INVESTMENT

It is useful to explicitly define key relevant criteria for assessment of the merits of various potential policy mechanisms to increase clean energy investment. Drawing on broader sets of criteria advanced in recent climate policy literature,⁴ the core criteria used to evaluate hybrid funds could include:

- Capacity to align incentives effectively among key actors
- Capacity for flexible risk allocation and optimal risk mitigation
- Scale, scope and sustainability of financing generated

“Public-private equity funds combining capital contributions from governments with private capital from institutional investors would represent a creative new approach to the policy problem of how best to catalyze sustained, large-scale increases in private investment in clean energy.”

- Capacity to generate synergy among its constituents⁵, achieve a significant multiplier effect, and create new public and private value (Lasker et al. 2001)
- Political feasibility and durability
- Effective management

HYBRID PUBLIC-PRIVATE EQUITY FUNDS

Public-private equity funds combining capital contributions from governments with private capital from institutional investors would represent a creative new approach to the policy problem of how best to catalyze sustained, large-scale increases in private investment in clean energy. Large public-private equity investment funds would be ideally suited vehicles to synchronize: 1) achieving the target return preferences and acceptable risk levels desired by institutional investors with 2) sustained investments at the large scale and long term needed in the subset of clean energy technologies currently at the deployment, diffusion, and initial maturity stages (UNEP 2009). By investing public capital (drawn from national development assistance and climate change budgets) as part of the asset base of such funds, governments would send a powerful signal to the private sector of their commitment and confidence in the long-term viability of the target sector.

PARTNERSHIP SCALE AND STRUCTURE: PUBLIC-PRIVATE SYNERGIES

Such public-private investment vehicles would also receive preferential access to governmental and multilateral development bank (MDBs) risk mitigation instruments for investment. The combination of governmental capital invested and concessional risk mitigation instruments would offer a stronger inducement to institutional investors to invest in such funds than either element alone, leading to a significantly larger scale and scope of total financing. Beyond their superior scale, such hybrid investment funds dedicated to clean energy could also generate high levels of synergy from the complementary resources of public and private sector partners. Partnership synergy will arise if the hybrid funds are able to create public and private value that is significantly greater than what would be possible if the partners acted independently. The specific pathways to synergy for hybrid funds include: improved risk allocation among public and private actors in clean energy; access to private sector fund management expertise and institutional capacities not available within the public sector; alignment of public and private partners' incentives to more efficiently promote policy goals; conservation of scarce public funds; and faster promotion of private sector investment and market development through building a track record in clean energy investments.

If implemented to maximize the volume of capital raised, the new

hybrid funds could use a fund-of-fund approach to provide anchor investments in multiple smaller-scale national or regional clean energy funds and end-projects, triggering increased interest from other private investors and bank lenders. This could create strong secondary multiplier effects in financial and commercial markets for clean energy, leveraging the initial amount of investment from the funds to maximize the probability of significant follow-on investments from third parties.

“Partnership synergy will arise if the hybrid funds are able to create public and private value that is significantly greater than what would be possible if the partners acted independently.”

RISK ALLOCATION AND INCENTIVE ALIGNMENT

Sources of risk constraining greater private investment in even relatively mature clean energy technologies may be categorized according to: 1) country risk; 2) policy risk; 3) currency risks; 4) demand side (deal flow) risk; and 5) multiple, overlapping risks not susceptible to specific separation (UNEP 2009). For the first four categories, international development banks can create a menu or package of financial and policy instruments to partially or wholly offset specific relevant risks. The range of instruments includes guarantees, credit enhancements, concessional debt

financing, carbon finance facilities, and related technical assistance. Relevant risk mitigation instruments are already in use in other sectors, such as loan guarantees and country or political risk insurance. Institutions such as the Overseas Private Investment Corporation (OPIC) in the U.S. and the Multilateral Investment Guarantee Agency (MIGA) have substantial experience with country, political, and policy risk mitigation for investments in developing countries. If adequate resources are directed to this approach, MDBs could readily build on relevant experience to scale up risk mitigation instruments specifically for clean energy investments in poor nations. Public-private equity funds can help mitigate this last category of risk, which may be viewed as sectoral risk, in addition to offering their investors access to the various risk mitigation instruments addressing the other four risk categories above. By contributing a segregated equity stake in low-carbon investment vehicles, governmental capital would be in a “first loss” position, bearing greater risk of loss-making or poorly performing investments than private investors. While all equity investors are subject to the risk of loss-making investments, the participation of public equity in the first loss position increases the aggregate level of losses needed for private investors to fall below their minimum expected returns. This makes the fund more likely to succeed from the perspective of its private sector investors (UNEP 2009).

Taking a public equity stake in hybrid

funds does not require assigning most of the gains to, or removing most of the risks from, the private investors. Applying widely used income distribution structures in private equity funds (known as the “distribution waterfall”), the investors in the first loss position are those who are the last investors to receive income and profit distributions from the fund (in private equity jargon, they are at the “bottom of the waterfall”). These investors both face greater risk if the fund performs poorly and receive potentially higher returns in the event the fund performs equal to or above its expected targets. In the private sector equity fund context, such investors are typically the fund sponsors or managers.

An innovative public-private equity fund could place some but not all of investor governments’ (or MDB) capital contributions at the bottom of the waterfall and therefore at the riskiest yet potentially most profitable position (in an analogous position to that of fund sponsors in the private sector). Ideally, this first loss position would be shared with large private or quasi-private sector investors with long-term investment horizons, such as sovereign wealth funds. The remainder of the public capital could be invested alongside the other private investors, bearing lower risk but also receiving potentially lower profits. This is a powerful way to align incentives and allocate risks among the public and private investors in hybrid funds to pursue the most effective investment strategy, maximizing the efficient use of the fund’s resources.

EVALUATION

Capacity to Align Incentives among Key Actors: High

Sophisticated design of a hybrid fund's income distribution and management systems will be essential to align incentives among its diverse investors. Adapting strategies from private equity funds' sophisticated management and distribution systems offer powerful ways to align incentives and allocate risks efficiently among partners who have contributed disparate amounts of capital.⁶ The fund's sponsors, the managers, have the greatest risk along with the highest potential returns. The rationale is that the fund managers, while contributing a fraction of the total equity compared to institutional investors, are the actors best able to select optimal investments and limit risks to investments. The investors are by definition passive investors seeking to achieve attractive returns based on the fund manager's expertise and knowledge.

In parallel, in a hybrid fund the MDBs and the private equity asset managers they appoint would together have a wealth of expertise in developing countries' clean energy sectors, and are best placed to identify and control the risks faced by particular investments. By placing MDB (i.e. governmental) equity in the first loss position at the bottom of the distribution waterfall, the fund would align the incentives of private (passive) and public (MDB) investors in achieving profitable investments. This also protects the institutional investors providing the

majority of the capital from the fund taking undue risks and inefficient investments of their funds. Receiving profitable returns on their investment in clean energy development projects would not conflict with the missions of MDBs, as such funds could always be recycled into the MDBs or national development budgets.

Risk Allocation: High

As this approach can offer access to risk mitigation instruments created by the MDBs, it benefits from flexibility in risk allocation among public and private sectors. This of course requires the MDBs to design efficient risk mitigation instruments and monitor the development of evolving risks and market actors' ability to take on more of the relevant risks over time. Large-scale public-private equity funds could in theory also create risks of crowding out private sector finance and distorting markets by transferring excessive risk from market-based mechanisms to governments. The stronger incentive alignment and equity investment of the MDBs in hybrid funds would motivate closer monitoring of risk mitigation to ensure it is not misused. It should be noted that none of the risk protection mechanisms would shield investments from all sources of risk, as that would result in unsustainable risk transfer and moral hazard.

Scale and Scope of Financing: High

The hybrid fund's combination of a public equity stake, with "first loss" position, and access to targeted risk mitigation will enable it to attract a

superior volume of private investment capital from institutional investors relative to other options. Its superior equity base will be further enhanced by expected access to health leverage ratios, given its focus on clean energy projects at the deployment or later stages. By acting as an anchor investor in a group of strategically chosen smaller funds, the fund could send credible market signals to other large investors and trigger additional co-investment in such funds. This strategy has been successfully used for promoting investors' participation in clean energy venture capital funds which target technologies at an earlier stage of development than the funds proposed here in the United States by the large California state pension fund Calpers in its recent "Green Wave" investing initiative.

Political Feasibility and Durability:
Medium

Hybrid public-private equity funds are not radically new approaches at the national level in some middle-income and developed countries, where they have been used in the infrastructure sector and in some cases in public venture capital funds. Such funds, however, would be novel instruments in clean energy, particularly on a large international scale. Providing some public equity to low-carbon private investment funds is also suggested in the current policy literature though it is viewed more narrowly as one element among the package of risk protection measures to be offered. Most academic commentators and international organizations addressing

the subject appear to limit the scope and scale of public equity to assistance for discrete projects, and generally rely on risk mitigation packages as a central strategy.⁷

This restrictive approach may be due to their unfamiliarity with the financial architecture of private equity funds, concerns about political feasibility, bureaucratic conservatism in adopting a model historically used in the private sector, and fears of moral hazard and excessive risk transfer from the private sector. In the author's view, these concerns can be effectively addressed through innovative institutional designs such as the model outlined previously, centering on calibrated risk sharing. It will also be important for hybrid funds to select clean energy technologies at appropriate stages of maturity based on objective, market evaluation, and not political considerations. Hybrid funds with private sector managers experienced in private equity are more likely to reach this goal relative to traditional public financing mechanisms.

Effective Management: Medium

A key consideration for this approach is finding an effective and balanced management strategy in light of the diverse consortium of investors in the hybrid funds. The most likely participants include private sector institutional investors (e.g. insurance companies), public pension funds, and sovereign wealth funds.

The challenge is for the management system to balance these investor preferences with accurate assessment of

market and policy signals in the target sector for finding the most promising investments. The expertise of the manager in investments in clean energy and related sectors in the targeted countries and its track record should clearly be the primary factor in its selection.

CONCLUSION

This paper suggests launching international public-private equity funds aimed at clean energy technologies at intermediate to late stages of maturity. This offers the greatest potential for rapidly mobilizing large volumes of private investment capital in clean energy. The large scale of capital – both equity and debt – likely to be raised and its greater efficiency and sustainability over time makes this approach favorable to exclusive reliance on public sector investment, conventional PFM alternatives, or private sector investment under current conditions. Hybrid equity funds are one element among many policies that will be needed to resolve the projected financing deficit preventing faster growth of the clean energy sector in many nations.

Hybrid public-private equity funds offer powerful incentives to institutional investors to participate, achieving greater scale of total capital and broader scope than the alternatives. Effective design of hybrid funds could enable alignment of incentives and risk allocation among the key actors. This would reduce the risks of wasteful use of resources, market distortions and

inefficiencies, and moral hazard often present in conventional PFMs (WEF Green Investing 2010). These risks were demonstrated by the impact of Fannie Mae and Freddie Mac (effectively PFMs) in the recent residential housing mortgage market bubble. In that case, PFMs effectively subsidized excessive levels of risk in housing finance and contributed to unsustainable market distortions.

A hybrid fund also has the most potential to generate synergy among its public and private participants and create strong follow-on market interest if its investments are efficiently distributed. As a novel but not unprecedented tool, its political feasibility is moderate and strengthened by some very recent MDB initiatives experimenting with variants of hybrid funds in other contexts.⁸ With regard to impact evaluation, a hybrid fund will have more incentives to prioritize comprehensive evaluations assessing progress toward policy goals and not rely on financial performance alone, relative to the alternatives.

Large-scale hybrid funds would represent a bold policy initiative both at the national level and in international development policy. Their success in achieving profitable returns on investments will in part depend on a set of factors largely outside their control. Principally, these external factors are: 1) future market conditions in many countries for clean energy implementation; 2) the future technical performance of clean energy technologies currently near maturity stage, which would

receive the bulk of the investments contemplated; 3) uncertain future energy policy environments at national and international levels, including the persistence of implicit subsidies and tax policies favoring fossil fuels. Many current market projections, official indicators from relevant government actors, and technology sector forecasts support favorable scenarios for clean energy in each of these areas. Yet inherent uncertainty persists in large-scale investment projects premised on major shifts from current patterns of energy use, largely due to the factors outlined above.

International public-private funds backed by governments, leading institutional investors, and MDBs making large-scale investments would confer stronger credibility and legitimacy on the target clean energy technologies. This is likely to favorably influence policy and regulatory environments in many countries for clean energy, as well as promote better market conditions. The majority of market analysts forecast significant positive returns – if relevant risks can be controlled – from maturing clean energy technologies operating in supportive policy environments (WEF 2010). There is a justifiable basis to conclude that in the aggregate such funds' investment portfolios are likely to yield at least reasonably positive returns, provided the funds have access to partial risk-protection resources.

Hybrid equity investment funds appear likely to trigger more investment momentum into clean energy than other options. The hybrid funds'

success in promoting wider expansion of clean energy investment will principally depend on whether the anchoring strategy and demonstration effects of viable investments lead to significant waves of third-party investment in the target sector. This will be more likely to occur if the funds generate a sustained multiplier effect in the relevant supply and demand markets. In this analysis of PFMs, the supply market is the future pool of investment capital interested in clean energy projects. The demand market is the future level of clean energy projects offering suitable returns to private investors (UNEP 2009). These factors will be influenced by both the investment returns achieved by the new funds and whether they are perceived as credible early market signals, or rather as unsustainable subsidies.

In a reasonable worst-case scenario, the funds would generate disappointingly low positive returns or break even. Even in this case, if the hybrid structure succeeds in generating a high ratio of private capital to public capital, there are low probabilities for large-scale public capital losses. The downside risks are fairly limited: the finite terms of investment funds enable investors to exit without indefinite commitment.

In the optimal scenario, the hybrid funds would have a transformative impact in accelerating commercial viability and diffusion of target clean energy technologies by triggering virtuous cycles of increased supply of investment capital for the target sector and increased project demand for capital. Clearly, this may not be realized

as external factors work against it, particularly the persistent obstacles and prolonged time frame involved in many markets to phase out subsidies and policies favoring conventional energy. Even in conservative scenarios, hybrid funds offer the possibility of healthy positive returns on public capital in clean energy. They also control risks of moral hazard and politicization common with conventional policies involving public allocation of capital to the private sector, while still conferring substantial public benefits from and influence over targeted private sector growth, expertise, and investment capital. Innovative investment partnerships offer powerful new ways to contribute to critical and converging policy goals: faster expansion of clean energy, energy diversification from fossil fuels, and reducing the threat of climate change.

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ENDNOTES

1 The term “clean energy” is broadly used in the policy literature and the media to refer to a diverse range of low-carbon modes of energy generation and use – e.g. solar, wind, hydro, geothermal, biomass, and bio-fuels. Clean energy of course can also extend to low-carbon modes of energy use in sectors outside power generation, such as transportation (e.g. electric cars), along with nuclear energy generation. This article’s use of the term focuses on low-carbon modes of electricity generation. Due to the environmental risks and uncertain political viability of a large-scale expansion of the nuclear energy sector, this paper does not include nuclear energy in its references to clean energy.

2 This paper refers to the potential of PFMs to attract additional dollars (“multiples”) of private sector capital per each dollar of public funds deployed as the “multiplier effect.”

3 Though based on limited available data, the broad range provides for optimistic to pessimistic scenarios on how much private capital may be raised.

4 The LSE Grantham Institute Report covers a broader range of issues and policies related to using public funds and policies to leverage private investment in climate change in developing countries. It develops criteria for policy approaches to increasing investment in the climate change area. This paper adapts and focuses some of the Grantham criteria to the hybrid funds considered here.

5 According to seminal work in the public-private partnerships field based on empirical analysis of real-world PPPs, the key potential sources of partnership synergy are: 1) complementary resources of its public and private partners; 2) partner characteristics; 3) partner relationships; 4) the partnership’s institutional features; 5) legitimacy in and support from the external environment.

6 Passive investors (limited partners) contribute the bulk of private equity (PE) funds’ capital. The fund sponsors use their specialist investment and sector expertise to actively manage and invest the investors’ capital with the goal of generating profitable returns for all the investors. Private equity funds with institutional investors often provide minimum capital recovery and threshold returns to passive investors before the sponsors can receive any profits. This places sponsors at the bottom of the waterfall, ensuring they are last in the fund’s income distribution order, and assigning them a large stake in any profits that may be achieved above the agreed-upon threshold targets. Such profits are super-returns and constitute the sponsor’s carried interest.

7 For example, the multilateral Clean Technology Fund (CTF) managed by the World Bank takes a relatively conservative approach to public-private partnerships in investment and largely uses risk mitigation as its major mode of engaging the private sector. The CTF currently does not prioritize the participation of substantial private capital in clean energy. While increasing private investment is among the CTF’s permitted activities and official goals, the private sector does not currently have a vote on CTF investment committees (non-voting observers are permitted), and private investors do not contribute at the fund-level to CTF capital resources.

8 Asian Development Bank recently invested in some privately managed equity funds. International Finance Corporation recently launched a subsidiary, IFC Asset Management Company, raising private sector investment capital for equity funds targeting specific sectors in selected developing countries (WEF Green Investing 2010; IFC Annual Report 2010).

ISSUE FOCUS:

The Global Water Crisis Is Too Big to Ignore

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by Thomas Healey

Governments around the world are only now awakening to the sobering dimensions of the global water crisis. In many ways more alarming and urgent than global warming, the water crisis impacts not just developing countries, but wealthier nations where dwindling freshwater supplies could imperil future growth and quality of life. According to the United Nations, one in every three people today faces serious issues around water scarcity, and that figure is expected to double to two-thirds of the population by 2025. In all, 1.1 billion people around the globe find themselves deprived of safe drinking water. But scarce water is only part of the problem, as decaying infrastructure and water pollution further contribute to the crisis. This article analyzes the foundations of the growing water crisis and describes a number of possible solutions, including advanced technology, improved water management practices, and greater public awareness driven by a robust international dialogue.

As global crises go, water scarcity has yet to rise to the level of urgent in the minds of the public. There is no high profile advocate or international conference to capture the world's attention. Unlike global warming, it has not ignited international debate or the search for solutions by the business, political, government, and scientific communities.

Yet in a very real way, the global water crisis is even more urgent and alarming than global warming, in developing and developed countries alike. Indeed, many experts in the field have made it clear than unless

we take steps now to improve the way water is withdrawn, used, and managed, the local shortages and unsanitary conditions that proliferate could easily escalate into a global water crisis impacting the environment, food supplies, and the health and well-being of people everywhere. Already, tensions over the ownership and use of water are a growing source of conflict between countries, threatening to touch off “water wars” around the globe while posing a serious security risk for many regions and countries, including the United States.

This article examines the underlying causes of the global water crisis, the impacts on nations and populations, and possible solutions that hinge on a worldwide awareness of the problem and a mobilization of resources across all sectors.

“The seeming abundance of water, particularly in the developed world, may inhibit an accurate sense of its scarcity.”

TRIPLE CRISIS

To better understand the gravity of the global water crisis, consider the following statistics:

- About 3.6 million people die each year from water-related disease (43 percent attributable to diarrhea), and 84 percent of those deaths are in children up to age 14, according to the World Health Organization (Bartram et al. 2008).

- At any given time, half the world’s hospital beds are occupied by patients suffering from a water-related disease, states the 2006 United Nations Human Development Report (UNDP 2006).
- One in every three people on the planet today faces serious issues around water scarcity, and that figure is expected to double to two-thirds of the population by 2025, according to former UN Secretary-General Kofi Annan (UN 2002).
- The World Economic Forum (2009) reports that the world operates in an unsustainable “water bubble,” noting that 2.8 billion people already live in areas of high water stress.
- The international consulting firm McKinsey & Company (2009) estimates that by 2030 the globe will have 40 percent less water than it needs if nothing is done to change the current consumption patterns.

These statistics paint a sobering and alarming picture. They point to three distinct but related water crises with their own sets of causes, consequences, and counter measures. The first is the widespread scarcity of water in relation to the demand from rapidly growing populations; the second, limited access to safe drinking water by millions of people around the globe due to inadequate and decaying infrastructure; and the third, polluted water supplies faced by millions more.

THE SCARCITY OF WATER

The seeming abundance of water, particularly in the developed world, may inhibit an accurate sense of its scarcity. However, only 0.007 percent of the earth's water is readily accessible for human use, the rest being nonpotable ocean water or inaccessible fresh water locked up in glaciers or permanent snow cover. According to experts in the field, one-third of the developing world is expected to face severe water shortages in this century, exacerbated by changing climate conditions and a growing population.

There is no better example of that threat than the receding glaciers of the Himalayas and Tibetan Plateau, which cover parts of five countries and provide the ice melt each spring that swells the great rivers of the region and sustains the irrigation and fresh water needs of nearly half the world's population. According to the satellite data from the Indian Space Applications Center in Ahmedabad, India, more than 1,000 Himalayan glaciers retreated by around 16 percent from 1962 to 2004, and Chinese researchers project that glaciated areas across the Himalayas could shrink 43 percent by 2070 (Malhotra 2009). If and when that happens, the results could be catastrophic. Other stark signs of global water scarcity abound in China's urban water shortages, Australia's decade-old drought, and repeated brownouts in Brazil and South Africa due to the lack of water to drive the turbines at hydroelectric power plants (*The Economist* 2009).

Fueling the problem are three trends: rapid population growth, the mammoth needs of agriculture, and global warming. First, as the number of people has soared from three billion to 6.7 billion over the past 50 years, global water use has roughly tripled. According to UN projections, the world's population could increase to more than nine billion by 2050, much of that growth concentrated in countries that are already water-starved (UN Population Division 2009). Second, farmers account for more than 70 percent of global water use (industry consumes less than a fifth and public utilities just a tenth), much of which is inefficient and wasteful (UNDP 2009). And third, while the precise long-term impact of global warming on water supplies is unknown, the resulting changes in weather patterns can significantly alter rainfall, river flows, and freshwater reserves. This will intensify drought-flood cycles and further exacerbate water management challenges.

DECAYING INFRASTRUCTURE

One of the Millennium Development Goals set by the UN and its more than 200 member states and organizations is to halve "the proportion of people without sustainable access to safe drinking water" by 2015 (UN 2000). The motivation for this goal is the 1.1 billion people around the globe, many of them in developing countries, for whom the challenge is not scarce water but access to *safe* water.

The challenge is formidable given the fact the biggest impediment to potable water access is inadequate or decaying infrastructure and systems needed for water storage, supply, and treatment. The problem is most acute in poor countries which lack the capital to fund large-scale infrastructure development like reservoirs, water treatment plants, and delivery systems to bring water to population centers. When these facilities *do* get built, governments often lack the money to maintain them. In New Delhi, for example, up to half of the water supply is lost to cracked and aging pipes or alternative inefficiencies (Walsh 2008).

Even in countries with well-developed water distribution and sanitation infrastructures, deteriorating pipes and water facilities waste staggering amounts of the precious liquid they are meant to conserve. London's water provider, Thames Water, estimates that water leakage pilfers one-third of the water that enters the company's pipe system (*The Economist* 2006). In the U.S., the federal Environmental Protection Agency (EPA) has estimated that more than \$500 billion will be required to meet water needs, including improvements to drinking water infrastructure and the repair of pipe systems and water treatment plants (Copeland and Tiemann 2010).

Increasingly, the aging infrastructure is turning into a public health hazard. In the U.S. as a whole, bacteria that enters community water systems is responsible for 24 percent of waterborne disease outbreaks (Clark et al. 2002). In southern California, more

than 1.5 million people fall sick every year from bacterial pollution in the ocean that can be traced to defective pipes, according to a study by UCLA and Stanford University (Boehm et al. 2006).

The best prospects for a solution to the problem of safe water appear to reside in partnerships between the public and private sectors. These partnerships can help to defray the cost of massive repairs and upgrades to decaying infrastructures around the world.

WATER POLLUTION

Even a sound infrastructure, however, is no guarantee of safe drinking water, as public water supplies can become polluted with chemicals, microbes or other contaminants that render them unsafe or hazardous to drink. It is estimated that countries around the world dump about two million tons of human and industrial waste and chemicals, along with agricultural discharges (animal waste, fertilizer, and pesticides) into water supplies daily (Palaniappan et al. 2010).

The flashpoint for much of this pollution is the convergence of water and sanitation. Without adequate supplies of water for wastewater disposal, cross-contamination of drinking and bathing water by untreated sewage can occur, triggering outbreaks of disease and death. According to the Water Supply and Sanitation Collaborative Council (2008), lack of sanitation is the world's biggest cause of infection, and 88 percent of cases of diarrhea worldwide

are attributable to unsafe water, inadequate sanitation or insufficient hygiene. The problem is rampant in developing countries where waterborne disease is the leading cause of death in children under five. The 2006 Human Development Report estimated that improved sanitation facilities (particularly toilets) could reduce diarrhea-related deaths in young children by more than one third, and that if hygiene promotion was added, such as teaching proper hand washing, deaths could be reduced by fully two-thirds (UNDP 2006).

Even in the developed world, water quality is a serious issue. Witness the pollutants from diffuse, non-point sources such as fertilizers and pesticides used on crops and atmospheric deposition traceable to industrial polluters. Brown et al. (2008) assert that these forms of pollution can have wide-ranging impacts on human life and ecology through the accumulation of contaminants in bodies of water and through the biological food chain. Examples of pollution's ecological impact include hypoxia in the Gulf of Mexico, pfiesteria in the Chesapeake Bay, and the decimation of the Ganges River dolphins in the Indian subcontinent. In China, pollutants entering the waterways from factory waste, agriculture runoff, and municipal sewage have exacted a tremendous toll on the quality of the aquaculture, resulting in decreased international confidence in the country's seafood markets, according to a study by *The New York Times* (Barboza 2007).

A recent study by an international team of scientists found that rivers in the developed world, including those of the U.S. and Europe, were experiencing some of the highest threat levels despite decades of focusing on pollution control and environmental protection (Vorosmarty et al. 2010). Among the stressors contributing to this condition are pollution from industrial development, agricultural runoff, conversion of wetlands, and river habitat modification. Charles Vorosmarty, co-leader of the study and an expert on global water resources, notes that many countries fail to invest in addressing these underlying contributing factors.

THE POTENTIAL FOR CONFLICTS

Dwindling or disappearing reserves of freshwater have far-reaching consequences. The lack of abundant, safe, and accessible water is creating a combustible brew of deepening conflicts and potential wars both between and within nations.

Around the world, more than 215 major rivers and 300 groundwater basins and aquifers are shared by two or more countries (Barlow 2007). Examples abound of potential sources of water conflict: Israel, Jordan, and Palestine all rely on the Jordan River, which is controlled by Israel; Turkey's plans to build dams on the Euphrates River brought it to the brink of war with Syria in 1998; the Brahmaputra River has been a constant source of friction between China and India;

and flooding along the Ganges river caused by melting glaciers in the Himalayas is precipitating the illegal and contentious migration of displaced citizens of Bangladesh to India. Trouble has even occurred on the U.S.-Mexico border where a private group of U.S.-based water rights holders has used the North American Free Trade Agreement to challenge the long-term practice of Mexican farmers to divert water from the Rio Grande before it reaches the U.S.

“Former UN Secretary-General Boutros Ghali predicted that water could soon become as valuable as oil, touching off conflicts in parts of the world where the resource is most endangered”

In an interview with the BBC, former UN Secretary-General Boutros Ghali predicted that water could soon become as valuable as oil, touching off conflicts in parts of the world where the resource is most endangered, including Egypt, Ethiopia, Kenya, Uganda, Tanzania, Burundi, Rwanda, the Congo, and Sudan (Thomson2005). Officials in the U.S. are well aware of the implications for American global security and foreign policy. Dr. Allan Hoffman (2009), a senior analyst for the U.S. Department of Energy, has warned that U.S. energy interests in the Middle East could become threatened by water conflicts in the region. The danger of potential U.S. involvement

in water wars around the world was also sounded by a group of top retired U.S. military admirals and generals in a report published by the CNA Corporation (Sullivan et al. 2007), a nonprofit company which conducts in-depth analyses for government leaders.

Recognizing the stakes involved, the Washington D.C.-based Center for Strategic and International Studies (CSIS) has urged that water be elevated to a top priority by U.S. foreign policymakers. In its May 2009 Declaration on U.S. Policy and the Global Challenge of Water, CSIS called on the Obama administration to “spearhead a comprehensive and sustained global campaign to address the global challenges of water,” and to “develop an integrated strategy for national action on the global water campaign” (Frist and Isdell 2009). In an earlier report, the group had recommended close cooperation between governments and the private sector and enhanced efforts to mobilize public-private partnerships in the development of technological solutions to avoid a global water crisis.

POLICY SOLUTIONS

Some scientists and economists believe that the water crisis is not the result of having too little water to satisfy our needs, but instead a problem of mismanagement. Solutions to these problems will require international cooperation, innovative public-private partnerships, government intervention, and enhanced public awareness.

International Cooperation

As agriculture is by far the world's biggest consumer of water, it provides some of the most fertile opportunities for addressing the global water crisis and an illustration of the need for widespread cooperation. Indeed, experts believe that enhanced irrigation practices and technologies could produce vast improvements in water efficiency and conservation. For example, more than half the agricultural land in the U.S. is irrigated via a gravity-flow system, which results in up to 50 percent water loss due to evaporation, inefficiencies in water delivery to the crop-root zone, and runoff at the edge of the field (International Water Management Institute 2007). More practical, and still inexpensive, techniques such as chiseling, furrow diking, and land leveling could allow fields to absorb water more efficiently and produce less waste. Modern technologies like drip irrigation, micro sprinklers, and solid set systems are more expensive, but achieve significant water efficiencies that could pay off handsomely over time.

However, significant changes in agricultural practices will certainly require cooperation and partnerships at the local, national, and international levels. As Brown et al. (2008) explain:

The incentives for any one country to shift policies are quite low without substantial international efforts to ensure that other major agricultural nations will also participate. If new agricultural supply-chain

practices are part of the solution, industries need to be aware of these opportunities and national and local governments will need to find ways to incentivize and protect access rights for those framers and industries willing to undertake new business practices (13).

Due to the disincentives surrounding change, the driving force behind reforms to water usage in agriculture and most other sectors will be inter-governmental collaboration.

Public-Private Partnerships

Another area of opportunity for reform is water management practices that aim to increase the efficiency of water use. Various low-cost technologies exist to enhance water collection capacity in capital-starved countries. Wealthier countries can improve storage facilities linked to dams and reservoirs or erect aqueducts and canals to move water from regions that are resource-rich to those that are resource-poor. Rich and poor nations alike must invest in repairs to aging underground pipes and systems that leak countless gallons of water each day.

Infrastructure experts in the U.S. see a hopeful sign in the recent trend by struggling local governments to turn to the private sector for help in repairing decaying water systems. Private companies are often eager to explore these opportunities and have the technology and resources to engineer cost-effective solutions. Globally, cooperation between the public and

private sectors could play a pivotal role in providing the financial wherewithal to allow even basic repairs to crumbling infrastructures, thereby enhancing the public's access to safe drinking water.

Government Intervention

Inevitably, the acknowledgement of growing water scarcity will eventually require government intervention or regulation, perhaps following the pattern of regulatory bodies that help control the distribution of vital resources during times of war or national emergency. Governments in more developed countries, for example, can address water shortages by placing restrictions on the use of water for luxuries like filling swimming pools and watering lawns. Governments everywhere can take steps to repair or improve decaying or inadequate infrastructures as a way to maximize water capture opportunities and minimize water waste.

Governments must also work to prevent conflicts over water resources. Water conflicts between nations or populations are most readily and judiciously resolved when regional authorities, commissions or treaties are in place. The Indus Waters Treaty was signed in 1960 between India and Pakistan as a way to adjudicate any future conflicts over the allocation of waters between two nations with strained relations. Since then, the treaty and the Indus River Commission, which it created, have provided an effective ongoing mechanism for consultation and conflict resolution

through inspection, exchange of data, and visits. Regional cooperation allows the settlement of water disputes on the basis of the needs of individuals, and has proven to be the optimal way to ensure peaceful transactions regarding this essential resource.

Public Awareness

Over the long-term, the most potent tool in reversing the world's growing water deficit may be a concerted campaign to raise public awareness and promote water use behavior change. Most people in the developed world do not suffer from a lack of drinkable water or infectious diseases from contaminated water. Consequently, they discount, or simply fail to see, the urgency of the global water shortage, and continue to free ride off the efforts of more informed consumers. Any campaign to change behavior could build a strong public case on the multitude of shocking statistics regarding water use and waste throughout the world.

While some academics have begun to publicly discuss the severity of the global water shortage, high-profile celebrities and politicians have tended to rally around global warming. Educational outreach aimed at informing the public about the scarcity of water, and those at risk about the potential for contracting diseases through unsanitary water, has been conspicuous by its absence. Brown et al. (2008) put forth that the small body of knowledge surrounding the causes and consequences of the developing global

water crisis, as compared to climate change, may be partially to blame. The authors then suggest that a *global roundtable* for analyzing the causes and possible future consequences of water scarcity could help to bridge the information gap and serve as a rallying point for advocates worldwide, achieving what the Intergovernmental Panel on Climate Change did for global warming. Through this type of conclave, both the scientific and policy communities could gain a better understanding of the global drivers of the water crisis and begin to muster the tools and choices needed to directly address them.

Clearly, international dialogue and debate with the intensity of what is now taking place around global warming will be needed to give the crisis the exposure and sense of urgency it needs to trigger meaningful change. Due to the overlapping nature of water and climate change problems, advocates for clean water would be well advised to build on the success of the climate change movement and make smart water policy a highly visible component of solutions to mitigate the impact of global warming. Such dialogue must begin in developed countries and spread throughout the world through political and celebrity advocates, intense press and media coverage, and high-profile academic and government-sponsored forums. As experience has shown, once these efforts begin to accelerate due to coordination and cooperation across international borders, the ripple effects are felt everywhere.

CONCLUSION

For centuries, the world has treated water as an inexhaustible resource. We can no longer afford that luxury. Problems surrounding water scarcity, access, and quality have either reached, or are approaching, crisis proportions for a significant portion of the earth's population. The constellation of challenges include dwindling supplies, poor sanitation, crumbling infrastructure, rampant pollution, global warming, rapid population growth, growing demands of industry, and the absence of effective water policies and governance. The ability of nations worldwide to acknowledge and address these issues in the years ahead will impact economic growth, the health and well-being of their citizens, and the stability and security of their borders.

Mahatma Ghandi once remarked that "the difference between what we do and what we are capable of doing would suffice to solve most of the world's problems." Nothing could be more true in describing the global water crisis. Leaders and policymakers around the world need to take seriously the critical issues surrounding water scarcity, cleanliness, and sanitation, and act now to raise awareness of and fully address the problems through thoughtful, long-range solutions. To that end, governments need to mobilize a full complement of financial, management, strategic, and technological skills and resources, recognizing the positive return on investment that awaits them. Finally,

governments and authorities in all parts of the world must learn to work collaboratively to ensure that water issues and disputes are resolved peacefully and in a way that guarantees every human being access to safe and clean water.

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BETWEEN THE FARM AND THE DINNER TABLE:

The Impact of Farm Share on Body Mass Index in the United States

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I. INTRODUCTION

A century ago, there was little separation between Americans' food consumption and food sources. But today, countless middlemen have wedged themselves within this process.

One way to examine this growing phenomenon is to examine *farm share*. This is calculated as the percentage of every dollar spent on food that farmers receive for having produced it. The remainder constitutes the food's total 'marketing bill', which includes the cost of food processing, transportation, distribution and advertising.

Agricultural economist Stewart Smith has calculated that the average farm share for food consumed in America fell from 41 percent in 1910 to just 9 percent in 1990 (Smith 1993). As food processing plants began to play a greater role in feeding the nation, they created products that people just a few years earlier could never have imagined. In doing so, they claimed greater portions of the money spent on food products, while farmers received increasingly less.

This phenomenon might have been benign if the processed foods were healthier. However, the added ingredients—like sugars, fats, and oils—appear to have taken a serious toll on Americans' health. The purpose of this paper is to investigate the relationship between these two concurrent phenomena in the United States: falling farm shares and rising obesity. The results, as I will show, have important implications for American food policy as a key determinant of people's health outcomes.

II. LITERATURE REVIEW

Obesity, a topic of extensive research, is on the rise in the United States. Countless papers written on the causes of obesity implicate two key environmental factors as major determinants: an increase in energy consumed and a decrease in energy expended (Hill et al. 1998).

Simply put, Americans are eating more calories and getting less physical activity. Bleich et al. (2008) examine the relative importance of these factors and argue that caloric intake appears to have a greater effect on obesity than physical activity. The authors further examine the drivers of increased caloric intake and conclude that technological change, resulting in lower food prices, and sociodemographic factors, resulting in lifestyle changes, are key contributors to increased caloric supply. An analysis across 21 developed nations (Silventoinen et al. 2004) reaches a similar conclusion about the importance of energy supply as a factor in increasing obesity rates. In a more detailed analysis, Swinburn et al. (2004) cite a variety of probable risk factors for obesity which include sedentary lifestyles, heavy intake of high-calorie, low-nutrient food, food marketing, an abundance of sugar-sweetened drinks, and adverse socioeconomic conditions. The literature therefore supports the notion that consumption habits are key determinants of obesity.

But what is driving the increase in caloric intake? Cutler, Glaeser, and Shapiro (2003) argue that the change in the “division of labor in food preparation” may be the culprit (93). Since the 1960s, there has been a major shift from individual preparation of meals to mass preparation at commercial food processing plants. This significantly reduced the amount of time needed to prepare meals, thereby increasing consumption. High-calorie, low-nutrient processed food has gained a significant advantage from this shift in food preparation, allowing

people to consume higher-calorie foods more frequently. In 2000, the average American consumed 300 more calories per day than in 1985, with refined grains, added fats, and added sugars accounting for 93 percent of the extra calories (Putnam, Allshouse, and Kantor 2002).

These consumption trends are indirectly related to food prices. An analysis of U.S. food prices from 1950 through 2007 reveals a steady decline, though one insufficient in magnitude so as to account for the size of the increase in caloric intake (Christian and Rashad 2009). Instead, the phenomenon appears to be related to the components of food prices at the production and distribution stages. In particular, a disjunction has emerged between food prices and the cost of the farm products used as ingredients in the food people buy. Schluter, Lee, and LeBlanc (1998) elicit the processes underlying this phenomenon: food retailers identify and shape consumer preferences by adding value to food products, thereby procuring more of consumers’ food expenditures. In examining food marketing services, Waldorf (1966) found that one-third of the decline in farm share was due to increased consumer demand for marketing services (as expressed by consumers’ increasing purchases of processed foods), while two-thirds was due to increased supply of farm products. In the years following, the proportion due to marketing services has almost certainly climbed, as the consumption of processed foods has grown.

Interestingly the decline in farm share has not occurred at the same rate for all types of food. The United States Department of Agriculture has calculated farm shares for a wide variety of goods, from 6 percent for cereals to 39 percent for strawberries in 2003. Generally, fruits, vegetables, meat, and dairy products tend to have higher farm shares, and their rate of decline is slower than farm shares for other kinds of goods (Stewart 2006). This may have implications for government policies to encourage consumption of goods with greater farm shares, if this is likely to improve diet and health outcomes. Many authors have attempted non-empirically to locate the link between government farm policies and health outcomes. Elinder (2005), for example, argues that subsidizing overproduction of some foods has led to overconsumption and poor health. Similarly, Pollan (2006) contends that farm subsidies lead to obesity and other health problems but falls short of offering supporting empirical evidence. Unfortunately, research aimed at explaining this relationship from a more rigorous empirical perspective has also been fruitless. For example, several studies find little correlation between farm subsidies and obesity because the price of farm products as inputs for retail food products is marginal (Alston, Sumner, and Vosti 2006; Miller and Coble 2006). An international comparison of countries with varying levels of farm subsidies also failed to find a meaningful link between the subsidies and obesity (Alston, Sumner, and

Vosti 2008). Beghin and Jensen (2008) examined a potential link between U.S. farm subsidies and consumption of artificial sweeteners and found no strong relationship. A competing brief, however, notes that while there appears to be little current effect of subsidies on prices of high-fructose corn syrup, the implicit subsidy caused by low input prices can cause oversupply and encourage greater consumption (Cawley and Kirwan 2008).

The declining farm share of many foods consumed in the United States may explain the failure of previous studies to uncover a relationship between farm subsidies and obesity. Price cannot be the mechanism by which farm policies affect people's health since the decline in farm shares suggests that agricultural inputs account for a small proportion of the retail price of food. To avoid this problem, this paper will not use food prices as the mechanism linking farm policies to health outcomes. Rather, it uses farm share as an indicator of the level of processing that different foods undergo and examines whether the low farm shares themselves are responsible for rising obesity rates.

III. CONCEPTUAL FRAMEWORK

As shown in Figure 1, the average farm share of food bought in the United States has declined steadily since 1950. This is a product of the increasing role played by food processors, as well as falling commodity prices. At the same time, obesity rates in the United

Figure 1

United States Department of Agriculture Economic Research Service

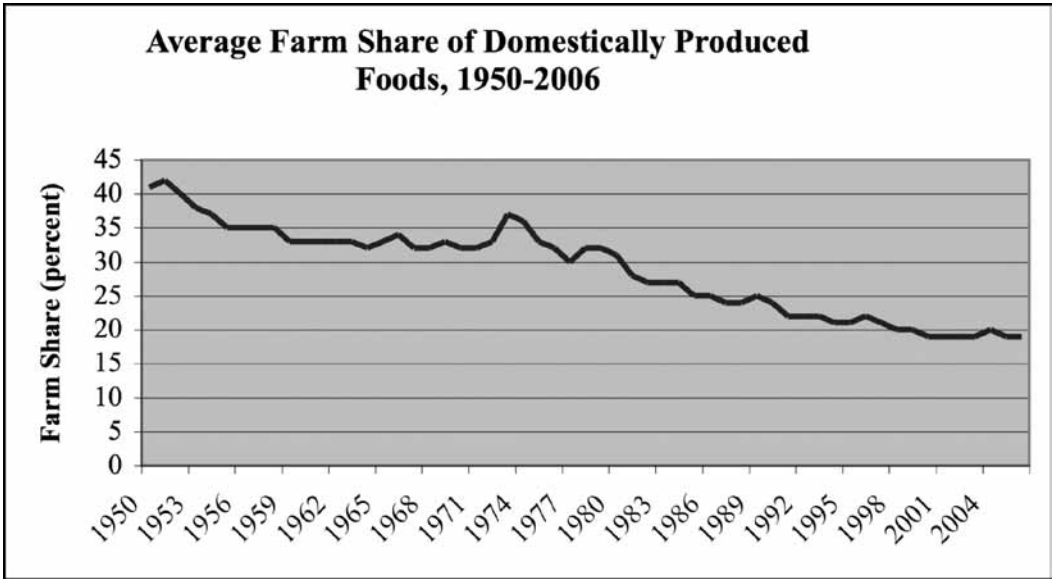
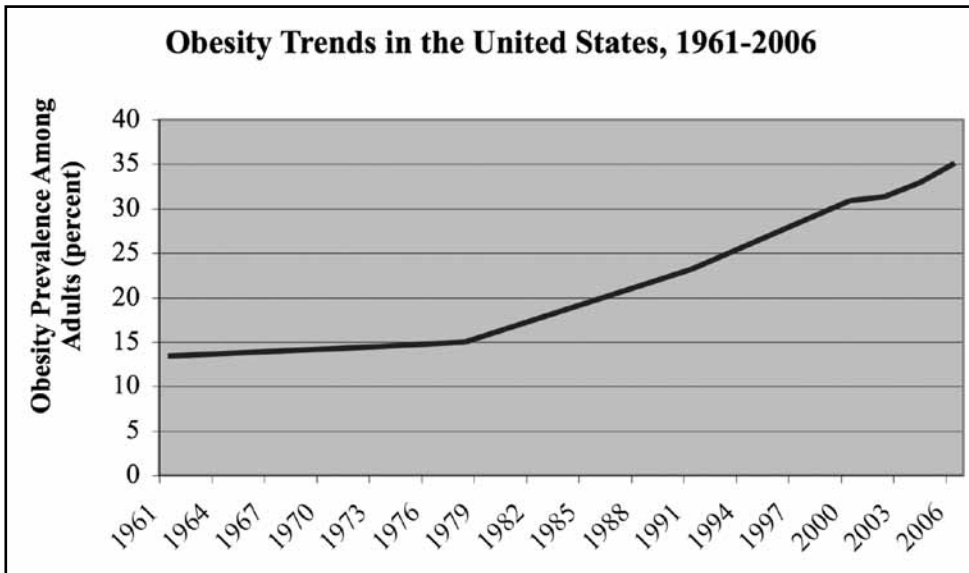


Figure 2

United States Centers for Disease Control



States have been steadily climbing (see Figure 2). The goal of this analysis is to explore a possible relationship between these two trends.

This analysis hypothesizes that people who eat more foods with lower farm shares are likely to have a higher body mass index. This is likely because foods with lower farm shares undergo more processing, which replaces raw nutritional value with “empty calories” and fat. Diets incorporating less-processed food allow people to eat more directly from the farm and limit the deleterious effect of added processing, which alters the foods’ nutrient content while reducing the amount of consumers’ money that farmers receive. Thus, individuals whose diets have a higher farm share are expected to have a lower BMI and a smaller chance of being obese.

IV. DATA AND METHODS

DATA

This study uses cross-sectional data from the National Health and Nutrition Examination Survey (NHANES). This survey has been conducted over many years, but this research will focus on 2003-2004 to utilize the most recent U.S. Department of Agriculture farm share calculations. According to the survey documentation, the target population of NHANES is the civilian, non-institutionalized U.S. population, and the survey includes over-samples to improve the reliability and precision of findings for subgroups of particular

public health interest, such as low-income people, adolescents aged 12 to 19 years, seniors older than 60 years, African Americans, and Mexican Americans. The survey design is a stratified, multistage probability sample of the target population. According to the NHANES documentation:

The stages of sample selection are: 1) selection of Primary Sampling Units (PSUs), which are counties or small groups of contiguous counties; 2) segments within PSUs (a block or group of blocks containing a cluster of households); 3) households within segments; and 4) one or more participants within households. A total of 15 PSUs are visited during a 12-month time period.

The total sample size for NHANES 2003-2004 was 12,761 individuals aged 2 and older. This analysis, however, restricts the sample to only those individuals over the age of 16, as data for several of the key control variables were collected only for respondents over that age. The response rate for interviews was 79 percent and the response rate for in-person examinations was 76 percent. NHANES 2003-2004 has four separate components: Demographics, Examination, Laboratory, and Questionnaire. This analysis will use data from three of these components:

- Demographics. This component of the dataset will provide the demographic information needed for the model’s control variables. This data was collected by questionnaire.
- Examination. Two data files

from this component will be used: the Body Measurement file and the Food Frequency Questionnaire DietCalc Output file (see explanation below). These datasets will provide information on people's eating habits, as well as their body mass index (BMI) – two central elements of the model. The data in this component was collected during in-person medical exams by health professionals.

- Questionnaire. This component contains information obtained through a comprehensive questionnaire about a variety of health measures and behaviors, use of medical treatments, health insurance status, and other topics. This analysis will focus on variables relating to respondents' typical amount of physical activity and exercise. This will join the demographic information as a control variable.

EMPIRICAL MODEL

This study will use ordinary least squares (OLS) regression to estimate the following model,

$$BMI_i = \beta_0 + \beta_1 FARMSHARE_i + \beta_2 X_i + \beta_3 P_i + u$$

where

- BMI_i = the body mass index for each individual
- $FARMSHARE_i$ = the total farm share of individuals' diet
- X_i = a vector of an individual's demographic variables, including

gender, age, race, income, and marital status

- P_i = a vector of an individual's typical engagement in various physical activities, including walking/bicycling to work, moderate and vigorous exercise, and physically-demanding household chores

The dependent variable in this model is body mass index (BMI). This is a standard measure of an individual's body fatness, according to the U.S. Centers for Disease Control, and it is useful in diagnosing possible health problems stemming from one's body weight. The independent variable of interest is farm share.

In order to determine the total farm share of each individual's diet, data from the NHANES Food Frequency Questionnaire was combined with U.S. Department of Agriculture calculations of the farm share for a wide variety of foods. The Food Frequency Questionnaire DietCalc Output is a component of NHANES that asks individuals to report the frequency of their consumption of 152 different types of food over the preceding 12 months. Using this data, DietCalc software was used to convert the questionnaire responses into daily frequencies for different foods and food groups. The algorithms used by the DietCalc software assign daily frequencies as follows:

For beverages:

Never = 0
 1 time per month or less = 0.03

2-3 times per month = 0.08
1-2 times per week = 0.21
3-4 times per week = 0.5
5-6 times per week = 0.79
1 time per day = 1
2-3 times per day = 2.5
4-5 times per day = 4.5
6 or more times per day = 7

For foods:

Never= 0
1-6 times per year = 0.01
7-11 times per year = 0.028
1 time per month = 0.033
2-3 times per month = 0.08
1 time per week = 0.14
2 times per week = 0.29
3-4 times per week = 0.5
5-6 times per week = 0.79
1 time per day = 1
2 or more times per day = 2

To apply farm shares to each of these frequencies, the foods included in the NHANES survey were first matched with the farm shares from the USDA. Matches were possible for 68 of the 152 food categories included in the NHANES survey (a list of these foods and their corresponding farm shares is provided in Appendix A). A match was not possible for the remaining foods for two reasons: Either the USDA has not produced farm share calculations for those foods or the foods were too complex (that is, they consisted of many different ingredients with many different farm shares). Once the matches were made, a weighted average of each individual's farm share was obtained. This was done by multiplying each food's frequency by its farm share, summing these products across each type of food, and then dividing this sum by each individual's total

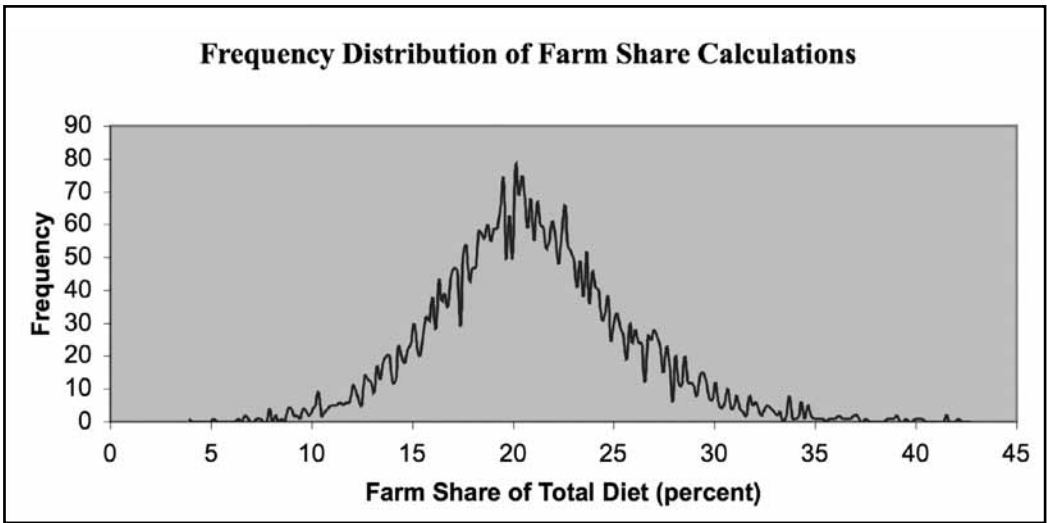
frequency for all foods. The resulting figure represents the average farm share of the individual's overall diet. Figure 3 shows that this statistic is normally distributed across the sample.

A variety of demographic data was included in the model. Gender is included as a basic control variable. It is a dichotomous variable equal to 1 if the respondent is male and equal to 0 if the respondent is female. As research shows that males are more likely to be obese in the United States than females, this variable is included to account for any inherent gender differences in the likelihood of being obese (Beydoun and Wang 2007). It is therefore expected that this variable will have a negative coefficient, meaning that being female will be associated with lower BMI.

Age is included in the model because research shows that people are more likely to gain weight as they age. Later in life, an individual's weight tends to decline (Beydoun and Wang 2007). Thus, the model contains both a linear measure of age (in years) as well as a quadratic term to allow for this type of relationship. It is expected that the linear term will have a positive coefficient, and the quadratic term will have a negative coefficient.

Education is another basic demographic control variable, specified as three dichotomous variables representing (1) less than a high school education, (2) a high school diploma or equivalency, and (3) more than a high school education. Research

Figure 3



has shown that people with higher levels of education are less likely to be obese (Halkjaer et al. 2003). This could be due to a greater awareness of the negative health effects of obesity, a greater ability to determine how to live a healthy lifestyle, or a greater likelihood of receiving and heeding regular medical care and advice. This variable is included in the analysis to control for any independent effects of education on the likelihood of being obese. The use of less than a high school education as a reference causes us to expect that the coefficients on the remaining education variables will be negative.

Income is included for reasons similar to education. In this model, it is represented by a continuous variable for each individual's poverty to income ratio (PIR). PIR measures the ratio of the individual's household income

to the poverty line for his or her household size, thus accounting for household size in a way that a straight measure of income cannot. Income is included in the model because it likely has an impact on both the types of food one can afford to buy, as well as one's preference for different types of food (Beydoun and Wang 2007). Moreover, like education, income could also affect people's likelihood of receiving regular medical care, which typically involves advice on healthy living and proper nutrition. Thus, income is included in the model to control for any independent effects on the likelihood of being obese. It is expected that, like education, the PIR will have a negative association with the dependent variable.

Finally, any measure of the effects of diet on obesity must also control for physical activity. In this model,

four dichotomous variables are used, representing whether in the last 30 days the individual engaged in:

- Physical activity, such as walking or bicycling, on the way to work or school.
- Moderate exercise producing a light sweat or a slight increase in heart rate for at least 10 minutes.
- Vigorous exercise producing a heavy sweat or a large increase in heart rate for at least 10 minutes.
- Housework or yard work producing a light sweat or slight increase in heart rate for at least 10 minutes.

It is expected that each of these variables will have a negative coefficient, representing an inverse relationship with body mass index. Descriptive statistics for all variables in the model are provided in Table 1.

V. RESULTS

The results of the analysis are summarized in Table 2. With respect to the key variable of interest, farm share of total diet, the results provide evidence of an inverse relationship between farm share and body mass index. The model produced a highly statistically significant parameter estimate of -0.0864 on the farm share variable. Specifically, this means the model would predict that a one percentage-point increase in the farm share of an individual's diet is associated with a 0.0864 reduction in his or her BMI, or slightly less than a tenth of a BMI unit. Likewise, an

increase in farm share of one standard deviation (4.79) is associated with a body mass decrease of about 0.41. While this does not represent a large effect of farm share on body mass index, the model nevertheless shows a meaningful, statistically significant relationship that may have implications for people's diet choices and for government agricultural and food policies, as discussed below.

Further evidence for the robustness of the model appears in its estimates for the control variables. The coefficients for gender, age, income, race, and three of the four physical activity variables were all statistically significant. The male dummy variable has a parameter estimate of about -0.5, indicating that males are likely to have slightly lower BMI than females. This finding is supported by the literature, which shows higher obesity rates among American females compared to males. The age variables (including both a linear and a quadratic term) also have statistically significant parameter estimates. This suggests that Americans' BMI rises as they age up to a certain point, when their BMI begins to decrease again in their older years. Again, previous research buttresses this finding (Beydoun and Wang 2007).

The parameter estimate on the income variable, poverty to income ratio (PIR), is marginally significant. PIR measures the ratio of a household's income to the poverty threshold for its household size. The negative coefficient on this variable suggests that the higher an individual's household income, the lower their expected BMI. This

Table 1: Descriptive Statistics for Regression Variables

| Variable | Mean | Std. Dev. |
|--|-------|-----------|
| <i>Dependent Variable</i> | | |
| Body Mass Index | 28.61 | 3.23 |
| <i>Explanatory Variable of Interest</i> | | |
| Farm Share of Total Diet (percent) | 20.87 | 4.79 |
| <i>Demographics</i> | | |
| Male (0,1) | 0.46 | 0.50 |
| Age in Years | 45.99 | 21.93 |
| Household Poverty to Income Ratio | 2.53 | 1.61 |
| Married (0,1) | 0.52 | 0.50 |
| <i>Education</i> | | |
| Less than High School (0,1) | 0.35 | 0.48 |
| High School or Equivalency (0,1) | 0.24 | 0.43 |
| More than High School (0,1) | 0.41 | 0.49 |
| <i>Race</i> | | |
| White (0,1) | 0.52 | 0.50 |
| Black (0,1) | 0.21 | 0.41 |
| Hispanic (0,1) | 0.24 | 0.43 |
| Other (0,1) | 0.04 | 0.19 |
| <i>Physical Activity (in past 30 days)</i> | | |
| Walk or Bicycle to Work/School (0,1) | 0.27 | 0.44 |
| Moderate Exercise (0,1) | 0.54 | 0.50 |
| Vigorous Exercise (0,1) | 0.31 | 0.46 |
| Household Chores (0,1) | 0.58 | 0.49 |

Table 2: OLS Estimates of Body Mass Index

| Variable | Parameter Estimate |
|---|--------------------|
| <i>Explanatory Variable of Interest</i> | |
| Farm Share of Total Diet (percent) | -0.08641*** |
| <i>Demographics</i> | |
| Male (0,1) | -0.49725** |
| Age in Years | 0.35242*** |
| Age in Years Squared | -0.00340*** |
| Household Poverty to Income Ratio | -0.11871* |
| Married (0,1) | -0.32985 |
| <i>Education</i> | |
| High School or Equivalency (0,1) | 0.48859* |
| More than High School (0,1) | 0.08766 |
| <i>Race</i> | |
| Black (0,1) | 2.25114*** |
| Hispanic (0,1) | 0.97020*** |
| Other (0,1) | -1.48419*** |
| <i>Physical Activity (in past 30 days)</i> | |
| Walk or Bicycle to Work/School (0,1) | -0.61718*** |
| Moderate Exercise (0,1) | -0.04985 |
| Vigorous Exercise (0,1) | -1.49653*** |
| Household Chores (0,1) | 1.06945*** |
| Observations: 4,074 R ² : 0.1054 | |
| *** Significant at 1% ** Significant at 5% * Significant at 10% | |

finding supports research suggesting that poorer Americans are more likely to be obese. While this might be counter-intuitive, the phenomenon is likely related to the relatively high cost of healthy food as well as the preponderance of cheap, high-calorie foods at fast-food restaurants and in grocery store aisles (Schmeiser 2008).

The results, however, do not reveal any statistically significant results related to educational attainment. They are, in fact, contrary to the intuition that higher levels of education are associated with lower BMI. With less than a high school education as the reference group, there is a marginally significant positive association between obtaining a high school degree and one's BMI. There was no significant relationship between BMI and education above a high school degree. These unexpected results might be explained by the relatively "blunt" measures used for specifying the education variables. It would be preferable to use a continuous measure of education by grade level completed, but the NHANES survey design does not provide this particular metric. Additionally, the lack of statistically significant results for the education variables may simply have to do with the lack of an independent effect of education on BMI. Rather, any effect of education might have been captured by other control variables, most notably age, income, and race/ethnicity. This issue is addressed further in a subsequent section.

The results were not statistically significant for the race/ethnicity

variables. Compared to whites, the results suggest that African Americans and Hispanic Americans will have higher BMI, while those falling into the "Other" race/ethnicity category will have lower BMI. This is in line with past research showing that black and Hispanic minorities are more likely to be obese in the United States (Beydoun and Wang 2007). As for the "Other" category, this is likely made up of Asian Americans, whom research shows are less likely to be obese than whites.

As expected, the physical activity variables were also found to be statistically significant, although with one exception. Both walking and biking to school or work and engaging in vigorous exercise are associated with lower BMI, while moderate exercise was not found to have a statistically significant effect. Interestingly, physical activity as part of household chores or yard work is associated with higher BMI. These mixed results may be due to the way that the physical activity variables were specified; that is, using dummy variables to represent participation in different activities at least once in the previous 30 days may not be the ideal way of accounting for individuals' actual levels of physical activity. Still, the complexity of the NHANES physical activity questionnaire made this type of specification most feasible, and moreover, the purpose of including physical activity variables in the model was for use as control variables, not to obtain specific parameter estimates. Thus, the specification of physical activity as four dummy variables is

likely sufficient to serve this function.

LIMITATIONS

Despite the generally robust results given by the model, there are a number of limitations to this analysis. First, the total farm share calculations for each individual's diet may be incomplete. This could be true for several reasons. First, it was possible to match farm shares for only 68 of the 152 food items that were part of the NHANES Food Frequency Survey. Of the foods for which matches were not possible, some contained too many ingredients to attach a single farm share (such as pizza and granola bars), while others simply did not have USDA farm share calculations available (such as clams and chocolate). Furthermore, the NHANES Food Frequency Survey applies only to foods eaten in the home and thus ignores eating habits in restaurants, at the workplace, in school cafeterias, and elsewhere. Finally, the NHANES survey may suffer from measurement error, as respondents might have had difficulty accurately recalling the types and amounts of food eaten during the preceding month.

The issue of measurement error, however, has important implications for the results of this analysis. Measurement error in the explanatory variable can have several consequences: it can bias that variable's parameter estimate toward zero, bias the parameter estimates of other independent variables in either direction, and increase the standard errors for each independent variable.

The most serious problems would occur if the food frequencies were measured with error systematically, that is, if a substantial portion of the error derived from individual mismeasurement of consumption habits. It is impossible to say whether this occurred with the NHANES survey. If measurement error did exist, it far from cripples the present analysis. Standard error may have been inflated, but most of the parameter estimates were nonetheless statistically significant and even reflected the expected relationships. The coefficients for the independent variables may, of course, have been biased. The most significant impact of measurement error might be the downward bias on the coefficient for the total farm share variable. Despite indicating the hypothesized relationship, this estimate had a small value and therefore reduced practical significance.

Another limitation is that the data used here comprised only 4,074 of a total of 12,000 observations from the NHANES survey. Some of this was intended: the sample was deliberately restricted to include only individuals over the age of 16, for example, due to the age threshold for the physical activity questions. However some of this attrition is the result of missing data, caused by certain observations lacking recorded data for one or more of the variables included in the model. As with the issue of measurement error, this missing data would present a problem if it occurred systematically—that is, if there were a common reason that certain individuals did not record data for certain elements of the survey.

In order to assess whether this may have occurred, descriptive statistics for each variable in the model were compared between those individuals included in the model and those who dropped out due to missing data. Based on this analysis, these two groups appeared not to have structural differences between them, and it is likely that the missing data occurred arbitrarily.

A final concern with the model is multicollinearity among the explanatory variables. If certain variables are highly correlated with one another, it could increase the standard errors of their slope coefficients. This risk would appear to be most significant for the education and income variables, which might be highly correlated with one another. Looking at the results of the model, the parameter estimates of the education and income variables are those that showed the least statistical significance, with either marginal significance (at the 90% confidence level) or no statistical significance at all. It is possible that this is the result of multicollinearity. However, since this analysis focused on farm share as the explanatory variable of interest and used education and income simply as controls, the key relationship found in the model is unaffected by potential multicollinearity.

VI. DISCUSSION

The results of this regression analysis indicate an inverse relationship between the farm share of people's diet

and their BMI. The policy implications of these findings hinge on two factors: (1) the relationship of BMI to public health, and by extension, to government health expenditures; and (2) the elements that constitute farm share.

A wide body of research continues to show a strong relationship between overweight and obesity (defined as BMI above 25 and 30, respectively) and an array of serious health problems, such as heart disease, diabetes, cancer, hypertension, and stroke. According to the U.S. Centers for Disease Control, overweight and obesity cost the nation up to \$92.6 billion in 2002 – or 9.1% of total U.S. medical expenditures (Fiebelkorn et al. 2003). Since half of this cost was covered through Medicare and Medicaid, the government has a major stake in reducing obesity. Moreover, these costs are rising quickly. A recent study at Emory University estimated that at current trends, 43% of Americans could be obese by 2018 – costing the United States \$344 billion per year and accounting for 21% of all health care spending (Sack 2009).

Given the high costs associated with obesity, policymakers should pursue policies that support lower BMIs for the American population. Such policies can take many forms and can target different determinants of overweight and obesity, such as eating and exercise habits. The results of this regression analysis suggest that the farm share of a person's diet is one mechanism that can be targeted to help lower BMI and reduce the occurrence of overweight and obesity. Increasing an individual's

total farm share by 10 percent, for example, can lower his or her BMI by 0.8 BMI units, a reduction that would likely bring health benefits to the individual and cost savings to the health care system and state and federal governments.

The question remains, however, as to exactly which types of policies could encourage people to eat foods with higher farm shares. The answer may lie in the determinants of farm share—that is, in what makes certain foods have higher farm shares than others. As explained earlier, the price paid for a food item includes two components: the cost of the raw products used as ingredients (which almost always originate from a farm) and the cost of the various marketing services involved in the food's production. These services include food processing, transportation, and advertising. Thus, a reduction in these costs will, by definition, increase the food's farm share, while foods that (1) undergo large amounts of processing, (2) are transported long distances, and (3) are heavily advertised will have lower farm shares. Hence, they will be associated with higher BMIs.

Policy makers, then, should look to craft policies that encourage the consumption of foods that undergo less processing, travel shorter distances, and are advertised less frequently. Currently, the U.S. predominantly subsidizes cereals and grains such as corn, wheat, and soy – crops that are used overwhelmingly in making processed foods with very low farm shares. Instead, policy makers should

reshape the system of agricultural subsidies to support the production of foods with higher farm shares, such as fruits, vegetables, meats, and dairy products. This could result in lower prices, greater production, and even increased consumption of these foods, which can raise the average farm share of people's diet and the associated reductions in BMI. In addition, policies should support the creation of local farms and farmers' markets to reduce the distance food must travel from the farm to the dinner table. This could improve consumer's access to fresh, non-processed, and non-preserved foods while driving down transportation costs that drive diminishing farm shares.

It is important to note that farm shares are not directly related to foods' nutritional value. Farm share is not simply an alternative way of talking about healthy foods and unhealthy foods. Foods with higher farm shares are not necessarily healthier, in the sense commonly accepted. High farm share foods include healthy fruits and vegetables, but they also include meat and dairy products, which may not necessarily be considered healthy food choices. Short of prescribing what Americans should eat, the government could offer guidance about what constitutes a healthy diet both directly, through public information campaigns, and indirectly, through production incentives and price supports. Overall, this analysis suggests that healthier diets limit the barriers that stand between American farms and consumers.

APPENDIX A: FOODS INCLUDED IN THE MODEL, WITH FARM SHARES

| Food | Farm Share | Food | Farm Share |
|---|------------|----------------------------------|------------|
| Fruit drinks: Hi-C, lemonade | 3 | Bagels/English Muffins | 4.6 |
| Milk (as a beverage) | 50.3 | Sandwich Bread/Rolls | 4.6 |
| Soda in Summer | 3 | Bread/Rolls not in sandwiches | 4.6 |
| Soda, Rest of Year | 3 | Peanut Butter/Other Nut Butter | 22.5 |
| Oatmeal - in the winter | 5.2 | Roast Beef/Steak in Sandwiches | 45.8 |
| Oatmeal - rest of year | 5.2 | Beef Hamburgers/Cheeseburgers | 45.8 |
| Cold cereal | 3.9 | Ground Beef in Mixtures | 45.8 |
| Milk on cereal | 50.3 | Hot Dogs | 37.5 |
| Applesauce | 15.8 | Beef Stew/Pot Pie & Veg | 45.8 |
| Apples | 24.95 | Roast Beef/Pot Roast | 45.8 |
| Pears | 21.89 | Steak | 45.8 |
| Peaches, nectarines, plums - in season | 23.22 | Pork/Beef Spareribs | 37.5 |
| Peaches, nectarines, plums - rest of year | 23.22 | Baked Ham/Ham Steak | 29.2 |
| Grapes | 22.77 | Pork | 29.2 |
| Strawberries - in season | 41.05 | Bacon | 29.2 |
| Strawberries - rest of year | 41.05 | Corn Bread/Muffins | 6.3 |
| Oranges - in season | 18.39 | Biscuits | 6.3 |
| Oranges - rest of year | 18.39 | Cheese | 31.5 |
| Grapefruit - in season | 14.02 | Ice Cream/Ice Cream Bars/Sherbet | 18.6 |
| Grapefruit - rest of year | 14.02 | Cake | 6.3 |
| Raw greens | 24.6 | Brownies/Cookies | 6.3 |
| Broccoli | 28.1 | Doughnuts/Sweet Rolls/Danish | 6.3 |
| Mixed vegetables | 26 | Sweet Muffins/Dessert Breads | 6.3 |
| Tomatoes - in season | 28.6 | Fruit Crisp/Cobbler | 6.3 |
| Tomatoes - rest of year | 28.6 | Pies | 6.3 |
| Lettuce Salads | 24.6 | Sugar/Honey added to Coffee/Tea | 26.5 |
| French Fries, Fried Potatoes | 19.9 | Milk added to Coffee/Tea | 50.3 |
| Potato Salad | 19.9 | Sugar/Honey added to Other Foods | 26.5 |
| Baked/Boiled/Mashed Potatoes | 19.9 | Apple juice | 20.8 |
| Dried, Cooked Beans | 18.8 | Margarine on Breads/Pancakes | 16.1 |
| Other Vegetables | 26 | Butter on Breads/Pancakes | 41.3 |
| Rice, Other Cooked Grains | 14.9 | Margarine on Potatoes/Vegetables | 16.1 |
| Pancakes/Waffles/French Toast | 18.8 | Butter on Potatoes/Vegetables | 41.3 |
| Other pastas, spaghetti | 18.8 | Oils for Cooking | 18.8 |

Note: Food categories are taken from the Food Frequency Survey component of the U.S. National Health and Nutrition Examination Survey, 2003-2004. Farm shares were calculated by the U.S. Department of Agriculture for 2003/2004.

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