

Center for Strategic and International Studies

“Press Briefing: The Impact of Sequestration and the Budget Drawdown on DoD’s Technological Edge”

Featuring:

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Location: CSIS Headquarters, Washington, D.C.

Time: 9:30 a.m. EDT

Date: Monday, September 12, 2016

*Transcript By
Superior Transcriptions LLC
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COLM F. QUINN: My name's Colm Quinn. I'm the deputy director of strategic communications here, and I'm swiftly going to be getting out of the way to let Andrew Hunter, the director of our Defense-Industrial Initiatives Group, DIIG, at CSIS, and his colleague Associate Fellow Jesse Ellman, take you through this report. They're going to give a brief presentation about the report and then we'll kind of open it to kind of a back and forth.

These guys will say this as well, but you know, at any point you want to stop and put up your hand, ask a question or kind of talk through the data and talk through the research, please do. It's supposed to be kind of a back and forth. The one thing I ask is try and use the microphone as much as you can, just because then it will pick up on the transcript. You'll be able to see it after. We'll be sending a transcript out before close of business today.

So, without further ado, hand over to my colleagues.

ANDREW PHILIP HUNTER: All right. Thanks, Colm.

Let me frame this study a little bit so you understand why we did it, what it is. We are going to focus almost exclusively on Department of Defense R&D trends of the last six or seven years because we think that's the most interesting and compelling piece of what came out of the study. But as the title of the study indicates, this study is actually not limited to DOD and it's not limited to the last six or seven years. It's 2000 to 2015 federal research and development contract trends.

So we looked at the – I think it's five agencies –

JESSE ELLMAN: Four plus other.

MR. HUNTER: Four plus other of the U.S. government that are main actors in federal R&D contracts. That's DOD, DOE, NASA, HHS and –

MR. ELLMAN: Everything else.

MR. HUNTER: And then everything else.

Now, that leaves out grants, of which, you know, there are other parts of the government that are much more heavily involved in grants, like the National Science Foundation. But because there's not really good data on grants, we looked at contracts.

And this is kind of the third in a three-part series, so if you will this is "The Return of the King." The first two parts being we did a study a while back on services, which would be "Fellowship of the Ring" if you're following along the analogy, and then second we did last year a study on products – so, you know, weapons systems and other goods that the government buys. So this is kind of three – a series of three studies that we did, and they're – all of which were sponsored by the Naval Postgraduate School, which is really the only organization in the world that I know of that does research on acquisition process and the acquisition system. So I just wanted to give you a little context of what this study is, why we did it, and then I'll get into what we found that we think is interesting.

MR. ELLMAN: All right. Just a couple of very brief notes on methodology. All of our data for this study comes from the Federal Procurement Data System. The data there, it's a wealth of data, has data on every contract over \$3,000 from 1990 to the present. But it incurs a few limitations.

First, it's only unclassified contracts. When you're talking about – when you're talking about R&D, obviously, that's a limitation. It's a consistent limitation over the entire period, so we think we can still do trend analysis. But we are missing a decent chunk of R&D activity just because classified data just isn't entered into FPDS.

The other limitation: this is only prime contract data. There's a separate subcontract database that we're hoping to start working with soon. The data there is fairly rough right now, which is to be expected because the database is fairly new. But those are the two main limitations that we're looking at.

And when we're talking about dollars throughout this, we're talking about constant '15 dollars. Everything is adjusted for inflation.

MR. HUNTER: All right. So I want to go through the findings that are our main findings. And the first one – and this may or may not be shocking to anyone – but there was a lot of concern when the defense drawdown started that R&D would be disproportionately impacted. Well, that happened. That fear was realized. And that's maybe not an earth-shattering point, but we thought it was important to point out because there was actually a bit of debate when Frank Kendall initially began expressing the concern that R&D was going to really get hit hard. There were some within the department who said, oh, it just looks that way because in our budget charts R&D always looks like it's falling off a cliff because programs finish R&D and you don't always know what the next program's going to be. And so they call it – they call it the horsetail effect, that the budget charts always have a horsetail for R&D where it's falling off like this in the out years. And they said, you know, that's all going to get fixed when we actually get there; that won't happen. Well, it turns out that R&D was disproportionately impacted by the budget drawdown.

And let me just take a quick note to explain what I mean when I say the budget drawdown. Federal contract spending peaked in 2009, and it peaked for two reasons. One was, obviously, we had the financial crisis, which caused the government to slow down and then start to cut its rate of spending, particularly in the discretionary arena, the funds appropriated by Congress. But the second impact, that is a major factor at DOD, is that the wars also started to wind down right around the same time. And so around 2010 was when the OCO funding started to begin to fall. And so you have this dual effect in defense spending, where you had the base dollars starting to be constrained and starting to be cut, but then the war funding came down. And in the early years, the drawdown is dominated by the reduction in war funding. In the later years, it was dominated by sequestration and the Budget Control Act cuts. But the combined effect is quite profound.

And – do you have the – do you have the numbers there?

MR. ELLMAN: Yes.

MR. HUNTER: So just to give you a little bit of a context, the contract spending for DOD, overall contracts, declined 35 percent. And that's in excess of the budget drawdown. So you have to kind of start with the fact that contracts fell more than the budget fell. That's because, essentially, the personnel accounts and other things that aren't used to pay for contracts – that are used to pay salaries –

those were – have come down, but not come down nearly as much because pay rates weren't cut. We did have a reduction in the size of the force, which led to some reduction in personnel spending, but that reduction in personnel spending was less than the overall budget reduction. So contracts took up a larger share of this budget drawdown.

The budget drawdown is about 28 percent over the period. Contracts overall were cut 35 percent. What we found is that R&D contracts declined 38 percent over that same period, so you see that R&D contracts –

Q: That's for the federal government overall?

MR. HUNTER: Oh, sorry, for the federal government overall.

MR. ELLMAN: DOD's 53 (percent).

MR. HUNTER: For DOD, R&D contracts fell 53 percent. So a significantly larger share of the contract reductions came out of R&D. And you have to keep in mind that in that overall 35 percent reduction, R&D is included, right? So if you were to back out the R&D reduction of 53 percent, you would see that everything else declined significantly less than the overall 35 percent. So R&D really was really substantially affected. That was, again, just to briefly recap, a matter of some dispute as we went into sequestration, was this going to happen. It happened. And when you consider that R&D was not something that was heavily, heavily funding by war funding, you know, that really is almost entirely a function of sequestration and the Budget Control Act.

Were there other things you wanted to point out on this chart?

MR. ELLMAN: Just two other things on this chart. First, notice NASA. NASA's probably, of the other agencies, the closest comparable to DOD, to the degree there is a closest comparable. Over the period, their R&D contracting is actually up 21 percent. So there's nothing inherent to the budget drawdown that says R&D contracting has to be, you know, hit harder than everything – harder than everything else. There's something particular going on in DOD.

And you can really see that in 2015. In 2015, overall DOD contracts were only down 5 percent. The decline in overall DOD is starting to level off. But in 2015, DOD R&D contracts were down 17 percent, over three times the rate. So as the overall DOD decline is starting to hit its floor, the decline in R&D is keeping pace or actually accelerating from where it was in 2014. So we may not even be seeing the bottom of where DOD R&D is going forward.

MR. HUNTER: And I should have said at the start, if you have any questions at any point, feel free to interrupt. We're not here to lecture you. (Laughter.)

Q: Yeah, so why do you see the decline continuing? Why is that?

MR. ELLMAN: Well, it's funny because it's not that there's one big program that's dropped off for R&D. It's really across-the-board reductions – Army, Navy, Air Force, you know, across the different stages of R&D. And we'll get to that in a – in a moment. But it's really just a continued broad-based decline in R&D contracting activity within DOD. It slowed a little bit in 2014, but then accelerated again in 2015, well in excess of the overall decline. And you know, we're – you know, we're 53 percent below where we were in 2009, so you know, I'm not sure how much further down we

can go, but I'd be hesitant to say that this is the bottom, you know, when the decline just accelerated greatly.

MR. HUNTER: And a little bit – you know, the question that immediately jumps to mind is, you know, why is this happening? (Laughs.) Where is the money going? What's being cut? That – and of course, as it the case with a lot you see in the budget – of course, everything's being cut, but even within R&D some things are being cut much more than others.

And so our second finding, what we see as really driving this drop in R&D, is what we call a six-year trough in the development pipeline for major weapons systems. So Jesse mentioned that there's not any one single program that you can say, oh, well, that was cut and then consequently R&D, you know, plunged. But there are several programs that have ended or have moved into a different phase that are notable.

You had the cancellation of Future Combat System and its various spinoffs like Ground Combat Vehicle that were also eventually terminated. So you had this – sort of the extended death agony of Future Combat System.

You have F-35, although it's not completely finished its development yet, as I'm sure you all know, moving pretty clearly into the production phase more seriously. They're approaching full-rate production decision, and the development program is within, you know, a year or two of ending. And that is, for the sake of this discussion, excluding the whole Block 4 issue, which is kind of a separate issue. But the original block development is almost done.

And so you see – you do see that some of these major development programs that were causing a lot of funding in R&D start to phase out. What you don't see is anything coming in to replace them. You know, so historically, you know, you get some variation in the level of R&D spending, but basically when you see one major acquisition program move into production, out of R&D, you'll see some other program that will go into a heavy development phase and it'll fill in the gap. And that's really what that argument was within the department about the horsetail effect, is something's going to come along to absorb or to fill in the gap of R&D funding. And what we've basically found is nothing came in to fill the gap. This trough developed.

And we use the word "trough" because – I've said gap, but you know, we don't want to convey that there's nothing there. It's not a complete absence of R&D spending, but it's a – it's a decided minimum compared to historical levels. So we've used the word "trough."

What we have here on this chart is the R&D contract spending by service, breaking out MDA because MDA is a pretty big part of this story, since it took actually the largest percentage share reduction of any of the major R&D activities. And what you see is that they're all down, and they're all down substantially, and they're all down more by that benchmark 35 percent, which was the total DOD reduction in contract obligations over this drawdown.

By far the most severe reduction is in the Army, and we'll get into a little more detail about how that played out. But the Army is down to 4.1, which is again a historic minimum for the Army. It goes down below the levels of the 1990s, the so-called procurement holiday of the 1990s. And this is in constant-dollar terms, which Jesse mentioned, but I want to reemphasize that. When we talk about it being below the 1990s, it's not overall, but it is in constant-dollar terms.

The Navy, as is almost always the case, is an in-between case.

The Air Force had the least reduction in R&D, but still substantial at 44 percent over the drawdown period.

And then the Missile Defense Agency down 68 percent. So that's obviously a huge reduction, and our colleague Tom Karako has written about that, had a report our pretty recently on those issues that's worth looking at if you haven't seen it. But that's reiterated in our findings that MDA had a huge percentage reduction.

MR. ELLMAN: And it should be noted, most – you know, MDA was actually doing really well up until 2015. 2015 MDA R&D was down 58 percent. And you know, at first when we were looking at this we thought, well, MDA is dominated by a few really large programs, a few really large contracts, and like a brief interruption in the timing of contracts could lead to what appears to be a drop. But when we looked deeper in the data, the cut is really kind of across the board throughout MDA's R&D contract portfolio. So we can't be sure if this is – that this is not a one-year anomaly, but it doesn't look like a one-year anomaly. It really looks like a fundamental change in what MDA is doing in R&D, just a – you know, a fundamental drop in what they're doing.

MR. HUNTER: And, Tony, I said if you have any questions, interrupt us.

Q: No, I understand. Thank you.

MR. HUNTER: OK. (Laughs.) I know you don't like to interrupt, but – (laughs).

OK. So where is this coming from? So we broke down the basic stages of R&D – you know, the classic categories of 6.1, 6.2, 6.3, 6.4, up through 6.7, although it always confuses me that there's no 6.6, but – yeah. (Laughs.)

MR. ELLMAN: R&D – 6.6 is R&D management support, which is really a service more than it is R&D, so we excluded it. That was included back in our services report because you're not actually talking about real R&D activity. It's just kind of the support activity.

MR. HUNTER: And so when you look at it in this terms – and this is – this is now not by service; this is looking at DOD as a whole – you see that the real – the real cut, the major reduction comes in the later stages of R&D, particularly in system development and demonstration, 6.5, is a huge one; and then also 6.3, which is advanced technology development, had the biggest reductions. You know, for SDD, the decline is over 70 percent.

And you know, a lot of the debate about what's going to happen to R&D was very much characterized as, well, we're going to consume – we're going to eat our seed corn. Now, of course, seed corn is a vague term. It doesn't have a technical meaning in defense parlance. But generally speaking, you know, your seed corn is that thing, you know, that you plant first. So it's kind of – you know, we took that to mean kind of the earliest stages of R&D were under threat. And they have fallen, as our data shows. More on the basic side than on the applied research side, but they've both gone down. But the really massive reductions have been in the later stages of R&D. And then that ties back to our point about the six-year trough in the weapon system pipeline, because it's those later stages of R&D that fund something to go through low-rate initial production and into full-rate production, and that's what's missing. And again, the major dynamic, if you go into the numbers, is

that we had the big programs of the 2000s either terminate or graduate into production, and nothing that came in behind to replace them in the R&D pipeline.

Q: So is it fair to say, then, that the early-stage R&D, if we consider that to be the planting of the seed, that's not what's been under threat right now? It's just sort of harvesting the seed that's under threat and moving the seed somewhere?

MR. HUNTER: Exactly.

MR. ELLMAN: Yeah.

MR. HUNTER: Yeah. I mean, and it's down, and I don't want to minimize that that's, like, insignificant. But in percentage terms, what jumps off the page is this, again, though that we've been looking at.

Q: But that also can be explained by the fact there's just nothing to harvest because FCS was canceled F-35 has moved on? That partly explains it?

MR. HUNTER: Well, but I think that's a choice. We'll kind of get into the various services to try and illustrate that.

The first one we have up here is Army. And – (chuckles) – the way I'd like to summarize this chart, obviously Army is – the Future Combat System case is absolutely dominant when you look at Army R&D. And you can see how big it was. In the 2006-2007 time frame, you're looking at \$4 billion, roughly, in both cases for system design and development. That's all about Future Combat System. And then it starts to slowly – you know, again, the slow death agony of Future Combat System.

But what's interesting to me is look at, if you can, the purple bar on the chart as you get to the last years. The way I describe it is it's invisible to the human eye. It's actually just ever-so-slightly visible, but you can't see the number because it's so small. And if you even go back to, you know, the year 2000, you can see the purple part of the bar. You know, it's not huge. It's not massive. It's not \$4 billion. But it – you know, it kind of ticked along at about a billion dollars over time for the Army, and it has just gone to almost nothing, you know. So that's where you see this choice to move away from SDD of any meaningful kind towards essentially, you know, not having anything in the development pipeline.

I think about it in terms of the JLTV program. You know, JLTV just didn't do development, right? They just said, hey, we're going to take – you know, bring to the table what you can build, industry, and if we like it we'll buy it. And that's essentially what they're doing. There's no significant development happening in that program. So it's a choice to focus on buying things in production and not to do development of new systems. And you see that in aviation as well, with, you know, modest increments of Black Hawk and Apache and Chinook.

MR. ELLMAN: And this is, you know, particularly troublesome for the Army. Army's the kind of most severe case of the three major services because, you know, after – you know, they have probably the – you know, one of the oldest fleets of vehicles, worn down by over a decade of operations in Iraq and Afghanistan. And right now, the – you know, the Army, there's a still – you know, in addition to all their budget issues, there's a great deal of uncertainty about what their future

missions are going to be, what their future requirements are going to be for those uncertain missions. So it's not even the case – it's not even the case that, well, they have this trough now but, you know, it looks like they're about ready to start buying things. For the foreseeable future, the trough looks likely to continue for the Army, because they just haven't been able to pin down what their next generation of vehicles needs to look like because they don't know what they're – they're still not sure what they're going to be using them for. So of the three major services – of the three services, really by far they're in kind of the longest horizon for coming out of this trough.

MR. HUNTER: And by the way, free advertisement, we have a study on Army modernization that will come out later in the fall. It's going to wrestle with that problem among other things.

MR. ELLMAN: And I should note, for the other – for the other two military services, the Air Force is probably the closest to coming out of the trough, primarily because the B-21 should be ramping up funding – or, is scheduled to be ramping up funding in the next two to three years. That'll be a lot of development dollars. The Navy is kind of an interesting case because they have obviously Ohio replacement, which is kind of just a behemoth on the horizon. But that's gotten pushed back out into the 2020s because of budget problems. So, you know, it looks likely that the trough for the Navy is probably going to continue at least through the end of the decade because their big development programs have kind of been pushed back by other budget concerns.

MR. HUNTER: Yeah, and then just to follow up on that briefly, you know, with the Air Force, the question is can they actually afford all this development as they go into trying to perhaps do a JSTARS recap development program to do the bomber development program, and then TX and some other things, so.

Q: In the Army – in the case of the Army, you mentioned they're not buying new systems or investing in new systems and they're buying off the shelf. So the cutbacks in R&D, are they offsetting that in any way with procurement dollars, so they buy more commercial equipment?

MR. HUNTER: Well, when you look at Army modernization over all, it's also down catastrophically in the 60-plus percentage level. So it's not – yeah. It's not that – it's not that there's a huge bulge in procurement spending, necessarily. But it's not insignificant. And you would say the historic ratio in the Army between R&D and procurement has shifted. And I'm migrating now into our Army mod research, but that's fine, which is to say that in previous drawdowns what the Army has tended to do is cut procurement drastically, take a procurement holiday, preserve R&D, and then when the money comes back buy new systems.

The draw down is unique for the Army, at least of the ones in kind of – you know, since we have data and modern memory, in the R&D has actually taken an even larger share of the reduction than procurement. Because when the money comes back, assuming it does, what will there be to buy? You know? You know, one of the retired Army types that I've talked to said, yeah, you know, the '90s were bad, and we were – you know, we went to war with the Army we had in 2001. But we also had things in the pipeline – blue force tracker, some of the armoring technologies. They had things that had been developed that they could then go buy when the war came and the money came.

And the question now for the Army is, you know, if another major effort kicked off tomorrow, what would the Army be buying? You know, they probably would be buying the same stuff they had before because there's just not much out there that's new. Unless, of course, there is the happy

scenario that says commercial industry will – you know, will just develop amazing things that we can buy. We don't have to do R&D anymore. Yeah.

OK, so what does this mean for industry? You know, a lot of the times I think the part of the story that doesn't get looked at as closely. You know, we all know that – you know, I think that it's not a shock to anyone that we're not buying – or developing a lot of new weapons systems at the moment, or buying a lot of new weapons systems at the moment. But what does it mean for industry? How does this actually affect the industrial base?

So our third finding is that there's been a significant shift in the industrial base. And I think you'll see that this all kind of flows together, hopefully, as we describe it. And the big shift, we believe, is driven by the fact that there is this gap in the major weapons system pipeline. Sorry, I used the word gap and we're trying to say trough, because it's not empty, it's just low. And so who builds major weapons systems? Well, primarily it's the big, traditional defense contractors everyone knows about that we call the big five.

Boeing, Lockheed, Northrop, Raytheon, and General Dynamics are the big five. They dominate the design and production of major weapons systems. And so when you look at market share of just defense R&D contracts – so this is a chart I don't think we've ever done before of this section of the industrial base. You know, when you look at the big five overall, they're doing OK. They're holding their market share. But what's underneath that is that they are losing – dramatically losing market share in the R&D contracts.

You know, I think there's different ways of expressing that. You could say they're disinvesting from R&D or you could say that the department is disinvesting from the R&D. I think the two are kind of related to one another. And industry has made that point, when people have criticized them about why aren't they putting more money in IRAD. Well, you look at this chart and you say: If I was in industry, why would I be throwing more money into IRAD, when the department's investment in IRAD, that I see, is dropping so dramatically?

So the reduction, you know, that was about 50 percent market share at the start of our study period for the big five. It peaked out over 60 percent in 2006, and then has been in a steady decline ever since, and is now down to, let's see, 33 percent for the big five. So, you know, almost a drop in half from the peak. In fact, I think it is a drop in half from the peak in 2006 – the share that's going to the big five.

Now, keep in mind that we're talking market share here. As we debriefed you already, the size of the pie here has shrunk dramatically, right? It's down 50 percent. So they're getting half the share they used to get of a pie that's half as big. And this is just – I mean, this surprised us. This was a finding we hadn't expected to see this severe an impact. And we're not crying big tears here for the big five by the way, but we just think it's notable about what's happened in the industrial base. There's a massive disinvestment from the big, traditional defense contracting R&D enterprise that has been there for many decades.

The good news story, if you will, is that small business' share of R&D is up. It's still down in absolute value terms, but as a share of the market small businesses are up, and medium is up pretty substantially.

Q: Could you identify some of the small players who benefit – the small to mid companies who benefit from this? (Off mic) – the big five.

ELLMAN: Well, I mean – I mean, we don't tend to, you know, look at them individually. But what we can say is, like Andrew said, it isn't that they're actually increasing the dollars that they're getting. But the fact that in a really tough market the relative minnows in the R&D marketplace are holding onto their piece of the pie and, you know, they're actually relatively holding their own as the big – you know, as the big five players are losing share of a declining market is something notable. And on the small business side, it might be considered a victory for small business policies that you're having these small businesses that aren't being shoved out of the market. They're managing to stay in a market, even as that market kind of – crumbles is probably too dramatic – but falls by half. You know, let's keep it to the statistics.

Q: A quick question on that point. To what extent do you think that disinvestment from the big five has to do with all the badgering of cost-plus contracting and the – maybe the shift that they don't want to give cost-plus R&D contracts anymore. And that would primarily would affect the biggest contractors. Is that an issue?

MR. HUNTER: The way I think about it is related to that, maybe not quite exactly as you've put it. I have this phrase that I've occasionally used, that I – and it's a little bit, you know, hyperbolic. So I'll say that up front. But I call it the end of MDAPs, which is for whatever reason, for whatever combination of reasons within the department and Congress and external, it seems that the degree of difficulty of generating support for a new major defense acquisition program has reached levels that, you know, barely anyone can get over the bar.

You know, basically, if you look at the new major programs that have kind of made it in recent years, a lot of them are related to nuclear modernization. So, you know, and they're SecDef interest items. You know, B-21 was something that had secretary of defense interest. Ohio replacement had secretary of defense personal interest. You know, these are the things that have gotten through. Then, you know, systems that don't seem to have that level of support, you know, they're just not getting through the system.

OK. So then – and this is a little bit to your question, Tony, about – you know, we looked at new entrants. So these are – actually, why don't you describe how we – clarify what new entrants are.

MR. ELLMAN: So what we – what we looked at is in each year, how many companies that previously had not been doing business with DOD in the R&D marketplace were entering the R&D marketplace. And as about 2008, about 1,100 vendors a year were coming into the marketplace. Now, a lot of those would do one year of work and fall out. But some of them stayed in. And you know, it's kind of a sign of the health of the marketplace that you have companies coming in, because that's how you develop new permanent – you know, new permanent vendors.

Q: Since 2008, did you say?

MR. ELLMAN: Yeah. So 2008, you had about 1,100 a year. By 2013, and it's been steady since, only about 400 new vendors a year were joining the R&D marketplace. So it's a decline of about 60 percent. It gets more interesting when you look at who these vendors are. You know, most of them are small or medium vendors. You know, medium vendors were declining at about the rate of the overall decline. But when you look at small, you have to look at small in two ways. You have your

always small vendors. Those are vendors, every contract they do with the government is as a small business, under small business rules.

Then you have your vendors which are sometimes small. You know, some of their contracts are under small business rules, some aren't. We think that's kind of a proxy for businesses that are starting to grow out of the small business realm. The sometimes small vendors, the number of those vendors entering the marketplace has declined by 75 percent. So for whatever reason, those growing vendors that are starting to grow out of the small business realm are being disproportionately discouraged from entering the DOD R&D marketplace.

The dollars – you know, but that's the line on the chart. The dollars there are a little more volatile. There's not a real trend there. But the dollars going to those sometimes small vendors are also down by 75 percent since 2009. So what we're really seeing is these growing, you know, vendors, these vendors kind of in that – in that gap, that a lot of people talk about, between – you know, where you're a little too big to be small, and you're a little too small to be big. They're being disproportionately affected and kind of, you know, shying away from the DOD R&D marketplace over the course of the budget draw down.

MR. HUNTER: Yeah, and the red line was a big surprise because in dollar terms the dollars going to new entrants are not substantially down. But the – as Jesse mentioned, no clear trend. But the number of firms getting those dollars is substantially down.

All right. So we've kind of given you our headline findings, as we believe what they are. What we want to do now is just kind of quickly let you know that when we started this study we had a series of hypotheses that we went out to examine. And our findings that we briefed you up front kind of came out of several of those hypotheses. We had other hypotheses, not all of which panned out. But there's actually, we think, some interest in some of the ones that didn't pan out as findings, because they were what we considered conventional wisdom. And of course, anyone could argue with that and say, ah, nobody really thought that. But at the time, we thought these were things that we had heard a lot out there in the, you know, blogosphere or the punditsphere about what was going to happen during the drawdown to R&D.

MR. ELLMAN: So this is just the list, and we'll go through them one-by-one. Yeah. So the first hypothesis, that cuts in R&D would be done kind of on an across-the-board, salami slice basis, rather than kind of reflecting a thoughtful prioritization of resources. And this sort of makes sense. When you get a directive from on high, cut 10 percent, there's a temptation to say, OK, everyone takes a 10 percent cut. And particularly with sequestration, you know, we thought we'd see sort of across-the-board cuts as we saw earlier, but there was a disparity between the different stages of R&D in the level of cuts.

We went down a level further – we went down a level further just to make sure we weren't missing anything. This chart – bear with me for a second – the dots on the black line represent the changes in each year. The increases, or more often decreases, in R&D contracting from year to year. The other – the colored dots in parallel for each year are the different stages of R&D. And what we felt like is if a majority of those stages, if four of the six saw declines within five percentage points of the overall decline, we thought that was evidence that it was an across the board cut rather than, you know, deliberate choices being made.

We didn't see evidence of that in any year, except 2013, the first year where you see the sequestration cuts. This is not a big surprise. But that's actually a little deceiving. For overall DOD, five of the – in 2013, five of the six stages of R&D declined within about 3 to 5 percentage points of the overall decline. But when you go down to Army/Navy/Air Force, that trend disappears. There's, you know, vastly different rates of decline for the different stages of R&D. It just so happens that it kind of averages out at the top line to – so that it looks like kind of a salami slice cut.

So what we said is there's no evidence to support the hypothesis that the cuts were kind of done across the board, because when you go down to the services, even in the – 2013, where it's the sequestration year, you just don't see any evidence that the cuts were done kind of evenly across the different stages of R&D.

MR. HUNTER: So, I mean, that's I think actually a little bit – I'm going to argue, a little bit of a good news story, in the sense that it wasn't all mindless. Might have been bad, but not mindlessly bad. (Laughs.)

MR. ELLMAN: Our second hypothesis: Newer R&D contracts will bear a disproportionate share of cuts during budget drawdowns. And again, this sort of makes sense. It's a lot easier to push back new work or decide not to do new work than to cut back on existing contracts, many of which are, you know, multiyear of – you know, a specific term, but contracts stretching over multiple years. It's a lot harder to end that work, cut back on that work, than it is say, oh, there's new work coming in the pipe, we'll push it back a couple of years. And so we expected to see declining shares of R&D contract dollars going to new contracts in each year.

What we saw was pretty much exactly the opposite. The back dotted line is overall DOD. The other three lines are the three military services. And you can see a pretty consistent trend – increasing shares of contract dollars for R&D going to new contracts in each year. And why is that? Again, it relates back to the trough. The big multiple year contracts tend to be those big development contracts. If you're not doing those big development contracts, a greater share of what remains is going to be new work each year, that kind of year-to-year small project work. So this is – you know, this was a surprise to us. But given, you know, what we found about the trough, it sort of makes sense.

Third hypothesis we already discussed. We thought that – you know, there was a lot of talk, particularly from – you know, from Undersecretary Kendall, from a lot of people, that, you know, that early stage seed corn R&D was going to be disproportionately hit in favor of preserving late-stage R&D tied to major programs. Pretty much the opposite happened.

MR. HUNTER: And let me just briefly – you know, a lot of the theory behind this, if you will, to the extent there was a theory, was that these big programs have so much political support behind them that they couldn't be cut, right? You know, X thing is being produced/developed in 50 different states and, you know, 400 congressional districts, so it can't be cut. And again – well, I guess in the case of some of the FCS programs, they were cut, other things just grew out of development. But what you see is that the system effectively can shift resources in a way to protect the earliest stage R&D. And that was a little bit of a surprise.

MR. ELLMAN: Fourth hypothesis, that large prime vendors will account for increasing shares. We saw earlier that was actually distinctly not the case. The big five – you know, the share of the big five has dropped by nearly half, and that's of a market that's declined by nearly half. So the evidence is pretty directly to the contrary.

MR. HUNTER: Yeah. So again, if you're a political scientist who thinks that everything is tied to, you know, the campaign contributions and the, you know, the inelasticity of procurement because of the political influence of contractors, we didn't see that in our data.

MR. HUNTER: Hypothesis five: During budget drawdowns, R&D will be increasingly funded out of non-R&D-focused budget accounts. So I kind of call this the couch-cushion hypothesis, the idea that as budgets are going down, you know, DOD would find, you know, find places to fund R&D out of that might not be traditional sources of R&D contract funding.

The data was basically no statistical significance either way. There weren't any real statistically significant changes in where R&D contracts were funded out of in terms of budget accounts.

The sixth hypothesis: During budget drawdowns, competitively sourced R&D contracts will attract increasing number of offers. And again, this makes sense. If you have fewer contracts, it kind of makes sense that more people are going to bid on them.

The data is kind of mixed. This chart looks only at competitively sourced contracts. So we're excluding sole-source R&D contracts for the moment, and we're looking at the number of bids that they're getting.

So if you look at the purple line, that's, you know, competitively sourced contracts receiving five or more offers, the share has actually gone up pretty significantly since 2008.

But then also, look at the blue line. That's competitively sourced contracts put out for competition, only get one bidder. That's also increased significantly.

At this point, 2015, 17 percent of overall R&D contracts are put out for competition, but only get one bid. That's over double the rate of overall DOD contracts. And for overall decreases, that rate's been decreasing over recent years. In R&D, it's been increasing.

A quick side note. There's been a lot of talk about, you know, from DOD data that overall DOD competition has been going down. That's only if you include single-offer competition as competition. If you only look at competition where they get two or more offers, it's basically been flat for the last decade.

And we really, you know, we kind of exclude single-offer competition from our usual discussion of competition. We call it effective competition. Just because if you're only getting one offer, you're less likely to be getting the benefits of competition. And we think a lot of times where competition only gets one offer, they probably had a good idea in advance they were only going to get one offer. And in a lot of those cases, they probably should have been justified as sole source to begin with. And that reduction overall kind of reflects that.

There's been a recognition in DOD that a lot of what was competition was single offer, probably should have been classified as sole source to begin with.

And then the final hypothesis: The budget drawdown will discourage new entrants. Of the seven hypotheses, this is the only one where we had strong evidence in support of that. We saw earlier just a huge decline in the number of new entrants into the DOD R&D marketplace, particularly in those

small, growing vendors who are kind of on the verge of coming out of the small-business marketplace and coming into kind of what we call the medium realm.

Do you have anything else?

MR. ELLMAN: I just want to open it up to questions, hopefully.

Q: So your research is released in a very interesting time at the Department of Defense. The secretary of defense is getting ready to go head out to Silicon Valley to try to generate more support among non-traditional companies to enter DOD to do R&D work.

What conclusions then can we draw from this research in terms of what Secretary Carter is trying to do out there? Do you, Andrew, as being someone who was AT&L, do you think they have an appreciation for this, for how low the R&D pipeline investment is?

I know Mr. Kendall has talked about, and you mentioned the dream scenario that, well, maybe we're just fundamentally not doing this anymore, maybe now the answer is to make commercial industry, make it attractive to them to do it. Is that a conclusion we can draw? Or help me sort of tie these two together as he heads out to California to try and make something happen.

MR. HUNTER: Yeah. Well, let me just say I really think a lot of this information is, you know, people may have a gut sense of it, but there hasn't – you know, I don't know that anyone has, unless they've done this analysis on their own separately, really knows these numbers in this way.

You know, even for the companies, you know, they tend to look at, you know, at revenues coming in. They tend to not spend a lot of time worrying about, oh, hey, is that a service contract, an R&D contract, you know. And their revenue numbers are OK, but this sort of underneath the data trend I think is something that is not readily apparent to anyone other than at a gut level prior to doing this research.

So I think this will be new information to almost everyone in industry other than, as I said, people know that there aren't a lot of new MDEPs coming down the road.

I think you kind of – I would tend to agree a little bit with the direction you were heading, which is, to some extent, the news here is that the system is less entrenched than it appears. I mean, it's in a bad place budgetarily. But again, this theory that you can't beat the big five, that they're just, you know, they're going to, you know, they have so much political influence, they're just going to, you know, knock everyone else out of the way and keep their hands as tightly around the money, the so-called iron triangle, you know, that is essentially the opposite of what we see being the case here.

You do in fact see a move away from, as we emphasized, from the big five, at least in the R&D space. Like I said, they've been able to keep their overall revenues OK by getting other kinds of contracts.

But if you're a, you know, a Silicon Valley firm considering the idea of breaking into the defense R&D game, you know, I think this data, again, the budget trend line is terrible, but the market access information would probably look pretty good.

Q: Does this add a sense of urgency then, in your estimation, to what the SecDef is trying to do to get new entrants into this or try to get commercial investment done, because we see that DOD is not providing that?

MR. HUNTER: Yeah. You know, it's kind of like, what's the chicken and what's the egg? And the answer is I don't know. But these things seem to be related, right? That, you know, the theory really for going to Silicon Valley is not so much that DOD doesn't have the money to do R&D, but it's that, comparatively, the commercial investment in R&D has grown so great that we don't want to miss out on it.

Well, that leads to the question then, is, OK – and that's kind of independent of what DOD's investment is doing. You know, that's just a global trend over which the department has no direct influence.

And so the question then is, OK, now we see that DOD's investment in R&D is in fact declining, and so is that related to the idea that they think they can get this technology?

You know, JLTV, again, is my paragon of the Army just saying, hey, why do a big development program, we'll just tell industry to show up with new designs; and look, they did, and they're pretty good.

You know, now, of course, you know, it's basically an MATV. And clearly, that's a tradeoff, right? That's not a cutting edge, you know, going to go dominate the future battlefield kind of a design.

So I don't know which is the chicken and which is the egg. And of course, it's not even clear with the chicken and egg which came first. But, you know, it does seem to be related. And how fundamentally, causally related it is, can't tell.

Q: Do you expect this trend you see to continue, with the big five contractors decreasing and these smaller firms increasing? And how does that work when so few new companies are wanting to do business with (the federal government)?

MR. HUNTER: I do expect it to certainly level out. I don't know if it'll head back in the opposite direction. But I think, as Jesse indicated with the B-21, potentially the, sorry to throw acronyms at you, but GBSD, I think this crowd kind of knows most of these acronyms, you know, these are things that are going to go into that big five bucket. Right?

You're not going to – well, we know already with B-21 that it's Northrop Grumman. With GBSD it's going to be one of the big five probably that's in the lead there. I don't think Elon is planning to bid on that one, but who knows?

So, you know, so that should at least level out the trend line to some extent. I don't know how much it'll recover it. And, you know, this is kind of one of those questions that if you knew the answer you could probably make a lot of money.

I don't know if any of you guys get the Capital Alpha stuff that they put out, but they're saying, you know, it's a big question for industry right of, you know, is the trend away from the big five? Is there a real threat to their dominance of industry going on here?

And I think one thing we learned is, yeah, I think there is a real threat because they've come down a lot. Now, how far does it go? That's another question that's a little hard to answer.

Sandra?

Q: Yes, thank you. So when you see the cutbacks in contracting for R&D, do you see any shift also in the government in-house R&D because they do want to sometimes take some programs in-house? So is some of the spending maybe not being cut from overall R&D, but maybe just from industry R&D?

MR. HUNTER: Well, that's a great question. It's something that we kind of observed by looking at the shadow. We don't have direct numbers of what's happening with DOD's internal obligations for research and development.

What we do know is that R&D contracts have fallen significantly more than R&D budget authority, which would certainly seem to imply that that internal R&D function is not falling, I mean, it just can't be falling as fast as the R&D contract spend.

But we don't have good data on what's happening inside that internal R&D spend.

MR. ELLMAN: I will say that within the RDT&E account, in terms of contracts funded out of the RDT&E account, the R&D contracts funded out of RDT&E have been falling a lot faster than the products or services contracts funded out of RDT&E.

So, you know, in terms of, like, actual, you know, in terms of actual, like, planes or, you know, planes or vehicles bought with RDT&E money versus the actual development work, that's been declining a lot. You know, it's still been declining pretty significantly, but it's been declining a lot slower than the pure R&D contracts funded out of RDT&E.

MR. HUNTER: Yeah, I mean, and we see that. I mean, our big acquisition trends report, which, by the way, the new version of that is coming down the pike in about a month or so, you know, the share of DOD's budget going to contracts has declined from 54 to 46. Are those numbers right?

MR. ELLMAN: Something like that.

MR. HUNTER: Yeah, so it's pretty significant when you think about the billions of dollars, hundreds of billions of dollars at stake, pretty significant decline going to industry. It appears that that effect is even sharper in the R&D space than it is for DOD overall.

Q: So going back to the government, I mean, the – (off mic) – potentially would be impacted if they have any round of base closures and then they were able to close maybe some of the labs because of maybe the political issues associated with cutting back on government labs that, you know, it has slowed down the reduction compared to the private sector?

MR. HUNTER: It could. It could. You know, again, we do our best to try and distinguish, you know, contracts that aren't really R&D, you know, that are more management or facilities related from real R&D contracts. So we hope that we have, to the greatest extent possible, kind of segregated out a lot of that sort of just keeping the lights on at the labs type spending from real R&D.

But I'm sure it's not perfect. You know, that's just the way the coding and FPDS is, it's not going to be perfect. So there's going to be some combination of things in a lot of those contracts.

And so it's possible that a BRAC that, you know, that shrunk the lab infrastructure could offset some of these reductions.

Q: On the new entrants, so your hypothesis seven bore out.

MR. ELLMAN: Yeah.

MR. HUNTER:

Q: Chart number 11 is the evidence for that.

MR. ELLMAN: Yeah.

Q: And I want to be clear, the peaks and valleys, this actual sequestration started in 2013 and then you had the two budget agreements.

MR. HUNTER: Yeah.

Q: And that's what reflects the little upticks, that the budget agreements had mitigated the impact or the full impact of sequestration?

MR. ELLMAN: Yeah. I'm a little hesitant to read too much into the dollar figures just because we're talking about 1 to 2 percent of defense R&D is going to new entrants.

Q: Right.

MR. ELLMAN: And it's so little money that if you have one big contract starting and ending, it could throw off the numbers.

But yeah, I mean, it's hard to look at 2013 with the impact of sequestration and not say, well, OK, you know, OK, that had an effect.

Q: Right. But then the upticks in 2015 and '14, '15, those are because of the budget agreements kind of mitigated? Is that one way to look at that or –

MR. ELLMAN: It's certainly possible.

MR. HUNTER: In the realm, Tony, that I have to say, in the realm of speculation, having been in the building in 2013 –

Q: Right.

MR. HUNTER: – and heard some of the discussions, a lot of the speculation is that, you know, in 2013 they just put stuff off. Right? And so what you see here is consistent with the idea that maybe some things that might have been awarded in '13 essentially got pushed into '14. But that's

speculation. We don't really have hard data to assert that that happened. But that certainly was something we thought was happening. And this is not inconsistent with it.

Q: Just the way it reads, 0.63 is 63 billion (dollars)? Is that –

MR. ELLMAN: No, it's, like – it would be 630 million (dollars).

Q: Six hundred thirty million (dollars). Thanks.

MR. ELLMAN: Yeah, yeah.

Q: Can I ask a data question, too?

MR. ELLMAN: Sure.

Q: How clean was the data with the federal procurement? You know, was that useful or –

MR. ELLMAN: FPDS has improved a ton. You know, I've been here about six-and-a-half years. We've been working, you know, our group has been working with FPDS for about 10 years. The data quality has improved by leaps.

The example I always use – when I first started working with it, when you looked at competition, about 20 percent of contract dollars, you know, when you looked at, OK, how were they competed, was unlabeled just because either it wasn't filled in or it was filled in, you know, you would have it competitively sourced, awarded out for competition with zero bidders, which always sort of confused us.

But the data quality has just improved. You know, there are still – there are still issues. The Air Force, up until this year, was labeling all tanker money as being for the Shillelagh missile, which was a 1970s Army anti-tank missile, because they started – they were reusing codes.

So there are – you know, there are data-entry issues. There are data-quality issues. But overall, you know, the problems in FPDS are consistent – are kind of consistent limitations. There's no classified data. It's only prime contracts. But once you account for that, the data quality, especially over the last four or five years, is pretty good. And they've made a lot of corrections kind of going back.

Q: Just one methodology question. Did you do this all online, or did you get disks from them, or –

MR. ELLMAN: FPDS, you can download the data. We've created our own mirror database on our own servers that we use to kind of cut up the data, because the raw data from FPDS is about as user-unfriendly as you could possibly imagine. It's hard to work with. And we've basically spent the last decade making it workable on our own internal servers.

Q: Using your own – like in an Excel spreadsheet, or –

MR. ELLMAN: We actually have it on a SQL server here.

Q: OK, good. Thank you.

MR. HUNTER: And then just one other point. And it's not maybe the most germane thing to today's discussion. But we recently learned that all of the F-35 money has been coded as Navy spending, because Navy – you know, the contracting activity has been NAVAIR. So if you look – we kept wondering. And the – if you look at the Air Force numbers, you say, well, where's the F-35 spending? And the answer is it's over in the Navy's – officially categorized as Navy spending, the way it's recorded in FPDS.

Q: And when they come up with contracts, it's usually NAVAIR is the awarder –

MR. HUNTER: Yeah.

MR. ELLMAN: We're working on a way to possibly, you know, see if we can kind of correct it on our side. We're always hesitant to make alterations – to, you know, alter the data that's coming out. But we think that's significant enough that we're going to try to see if there's a consistent way to, you know, identify what money is actually Air Force money and what money – we may have to go into the Treasury accounts. It gets a little – it gets a little dicey. But we're going to see if we can do that, because I think we're talking about billions of dollars a year. And, you know, it's all getting assigned to the Navy when a good chunk of that is Air Force money.

Q: I was just wondering if you were ever thinking about presenting recommendations connected to this, or is this just about kind of presenting data specifically for us to see?

MR. HUNTER: Well, the study is done, so we didn't do recommendations. Generally speaking, with these studies they are more exploratory. And some of them are more exploratory than others. You know, I mentioned one of our studies last year was looking specifically at acquisition reform, and we picked certain policies under better buying power that had been implemented and then tried to detect, can we actually see that things changed and that this policy was implemented, and over what timeframe?

And so, you know, that's one maybe where you could have had more recommendations. We didn't actually have recommendations in that, although there was kind of an obvious, like, it-takes-time-people conclusion to that study. You know, our baseline conclusion there was it takes at least two years to see any discernible effect from a policy change. So if you change policy and you don't see the system suddenly, you know, did something different, that's to be expected. But we didn't have recommendations on this one. We do occasionally do recommendations. I will say, in our Naval Postgraduate School-sponsored research, we've tended not to, because it's mostly about – you know, it's mostly an investigation and an exploratory.

I get very editorial in our events, though. So it tends to not be in the study. It tends to be more in, you know, other things that we put out.

MR. ELLMAN: Yeah, to the degree we have recommendations, it tends to be, you know, data-quality issues or we found something, you know, really unusual in the data. And we encourage – you know, we encourage people in DOD to look into what's causing this. We don't tend to go into sort of policy recommendations off our findings, at least in this – in these series of reports.

MR. HUNTER: We did find, you know, to that point, in this one there was one specific – was it the NASA contract? –

MR. ELLMAN: Oh, man.

MR. HUNTER: – that it was essentially three years of a contract were recorded in one year, and it totally skewed all the NASA data. So –

MR. ELLMAN: Yeah. It was an artifact of when they moved from an old system to a new system. They had a five-year, \$10 billion contract all in one year. So you had nothing, nothing, nothing, and then just gigantic. And I've said that – we contacted NASA. They were extremely helpful. We talked to some of the people at the Applied Physics Lab, where this – you know, the Applied Physics Lab, and they helped us out really –

MR. HUNTER: Was it Jet Propulsion Lab?

MR. ELLMAN: Oh, Jet Propulsion Lab. Oh, I'm sorry. We talked to people at the Jet Propulsion Lab. Within about a couple of weeks, they, you know, identified the issue. You know, they were limited in what they were able to do to correct it, but they were really helpful; helped us identify what was going on, tracked down the retired person who had been, like, their data person at the time. And, you know, we're not used to quite that level of cooperation, but it was really helpful. And we were able to kind of smooth out the data to a degree.

Q: Can I ask you, a couple of weeks ago Todd Harrison was here, and he pretty much debunked a lot of the draconian claims of the 2011. Where does your study fit in with that? There was a lot of claims that were made that didn't play out. Did some of the claims – do you verify that some claims actually were factual? I'm trying to put this in the context of what was bullshit and what actually played out.

MR. HUNTER: Yeah, I mean, that's why I kind of started with kind of the biggest macro thing is, yes, R&D really did get hurt. And it got hurt much worse than things overall. So that claim, which I think you could probably attribute strongly with Frank Kendall, that claim was true.

The exact way in which it happened, I think, was different than what a lot of people anticipated, as we've tried, you know, to lay out. It was maybe less about what you might classically think of as seed corn, more about MDAPs, which is a little sensitive, you know, maybe for the administration because they've been criticized about not having any weapon systems in the pipeline. And we see that effect.

So I think it's kind of a two-part story. It's like, yes, real damage happened in the R&D space, real significant damage. And it's significantly changing what's going on in industry as a result. But it didn't happen in the way necessarily that we all anticipated.

Q: And it was – behind this it was low. You couldn't really quantify it as it was happening. What you're doing now is quantifying what was not possible while it was happening. So, ergo, the public might not have thought sequestration was as bad as laid out. Is that –

MR. HUNTER: Yeah. If you just look at budget data, you don't see a lot of these trends. You have to get down into – you have to parse it into contracts. Then you have to sub-parse it into the kind of contract. What kind of work is being done? Then you start to see things emerge.

MR. ELLMAN: It's also just the difference between obligations, outlays and budget authorities. You know, obligations are kind of the closest we can get to when the money's going out the door. And that really kind of gives us kind of a year-to-year look on, you know, what's actually going on in terms of the contracting activity. And the story has really been just, you know, a huge decline.

You know, even in the context when you have a 35 percent overall decline and a 53 percent decline in DOD, that's not statistical noise. That's just a real major impact, disproportionate to everything else.

MR. QUINN: Well, if there's no more questions, I'd like to – I'm sure these guys will as well, but I'd like to thank you all for coming. We'll, of course, be putting – a transcript of this will coming out later in the day, so do keep an eye on your inboxes for that. And –

MR. HUNTER: If anyone didn't get it, this is the executive summary of the report. We're going to post the executive summary. The full report will be posted relatively soon, as soon as we have the PDF version all squared away. If you haven't already noticed it, Steve Welby is going to be here on Thursday talking about the state of the R&D enterprise; so one reason, by the way, we wanted to get this information out. So that'll be another interesting chance to get at these issues.

MR. ELLMAN: And, you know, if you have any further questions, if you think of any questions, any data points you want clarification on, please feel free to email us. We have more data than we know what to do with, and we're happy to share it.

MR. HUNTER: And do grab some food too before you head out. Please drink our coffee.

(END)