

# Embedded Tech Trends: Market Insights

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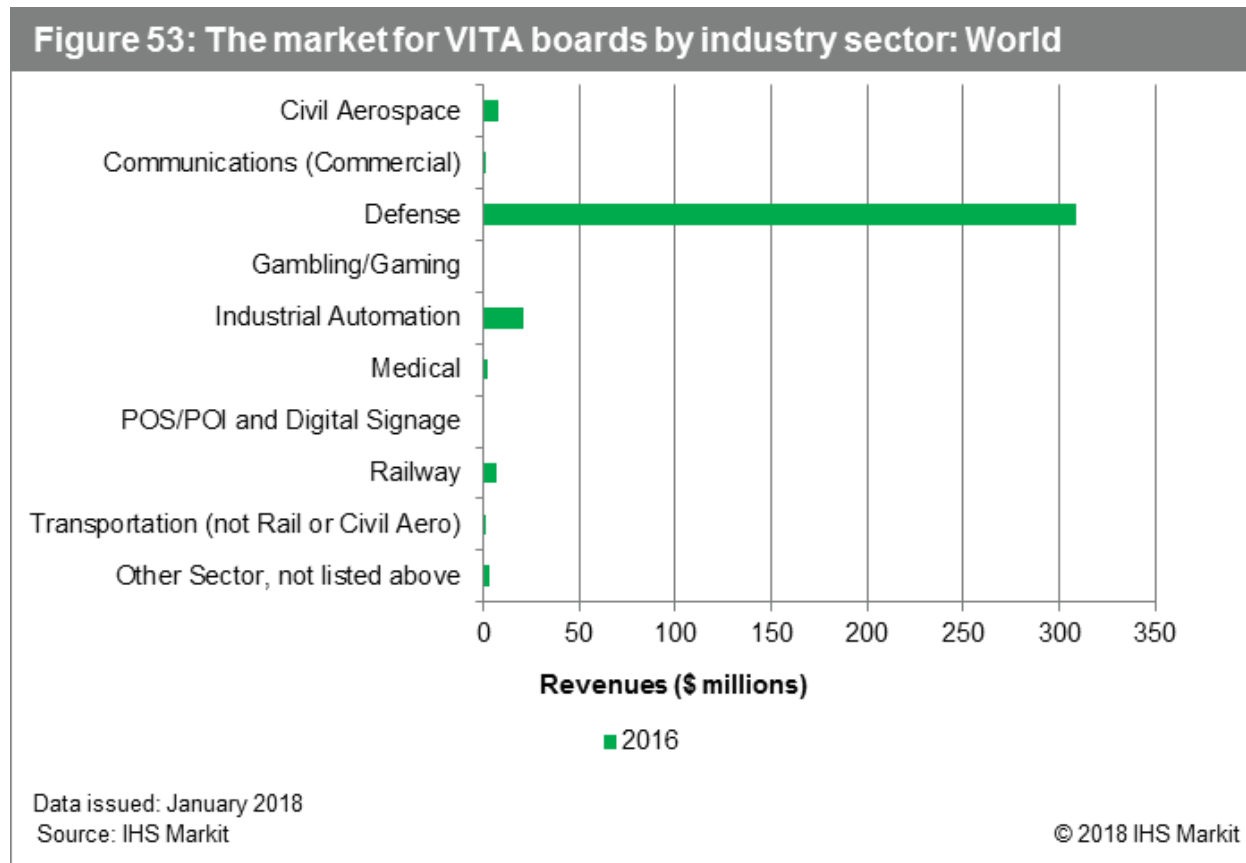
# Another year on and what has changed?.....

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## World VITA Boards and Systems Revenue (Preliminary data)

<b>Sales Revenue</b>				<b>% diff.</b>
<b>\$ Million USD</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2015-16</b>
<b>Boards</b>				
VME Boards	295	291	297	2.1%
3UVPX Boards	19	20	20	0.0%
6UVPX Boards	<u>32</u>	<u>34</u>	<u>35</u>	<u>2.9%</u>
<i>Total Boards</i>	346	345	351	1.7%
<b>Systems</b>				
VME Systems	72	71	71	0.0%
3UVPX Systems	36	37	37	0.0%
6UVPX Systems	<u>28</u>	<u>30</u>	<u>32</u>	<u>6.7%</u>
<i>Total Systems</i>	136	138	140	1.4%
<i>Total Boards and Systems</i>	482	483	491	1.7%

## Defense dominates, niche applications elsewhere.



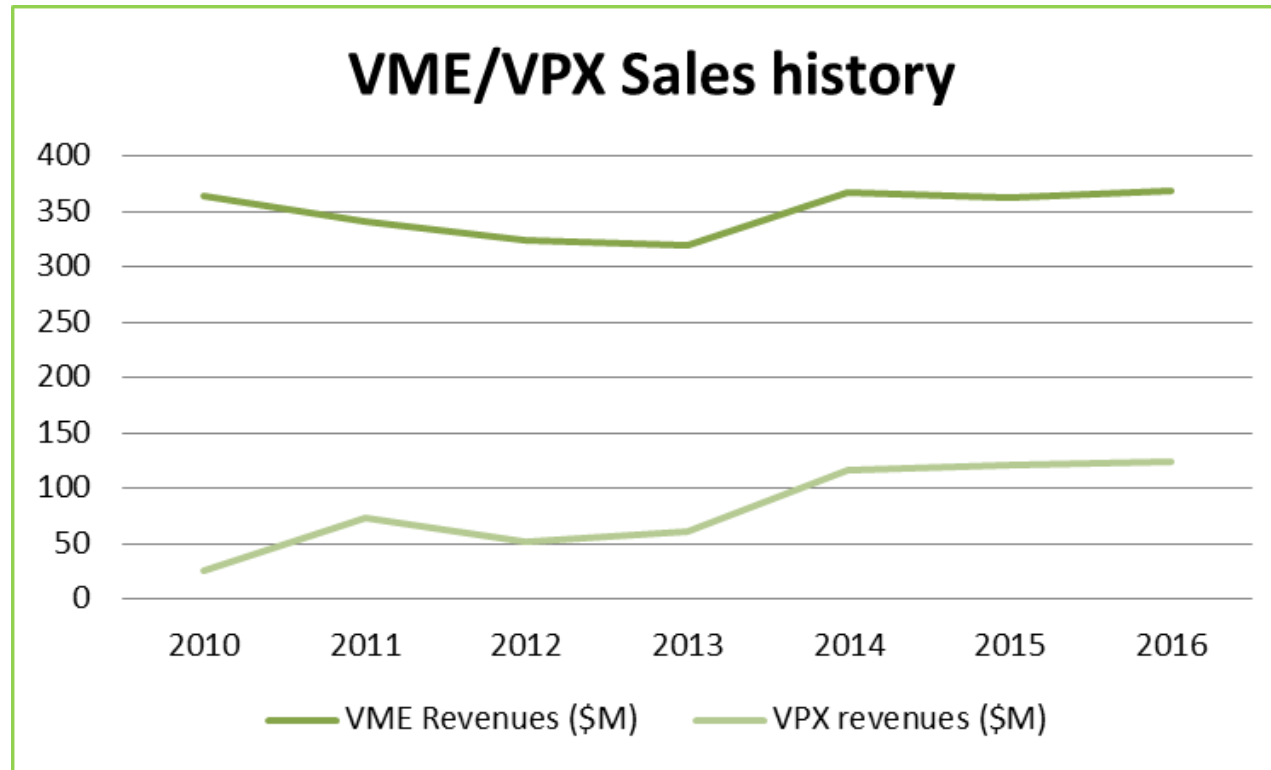
# Forecasting the future....

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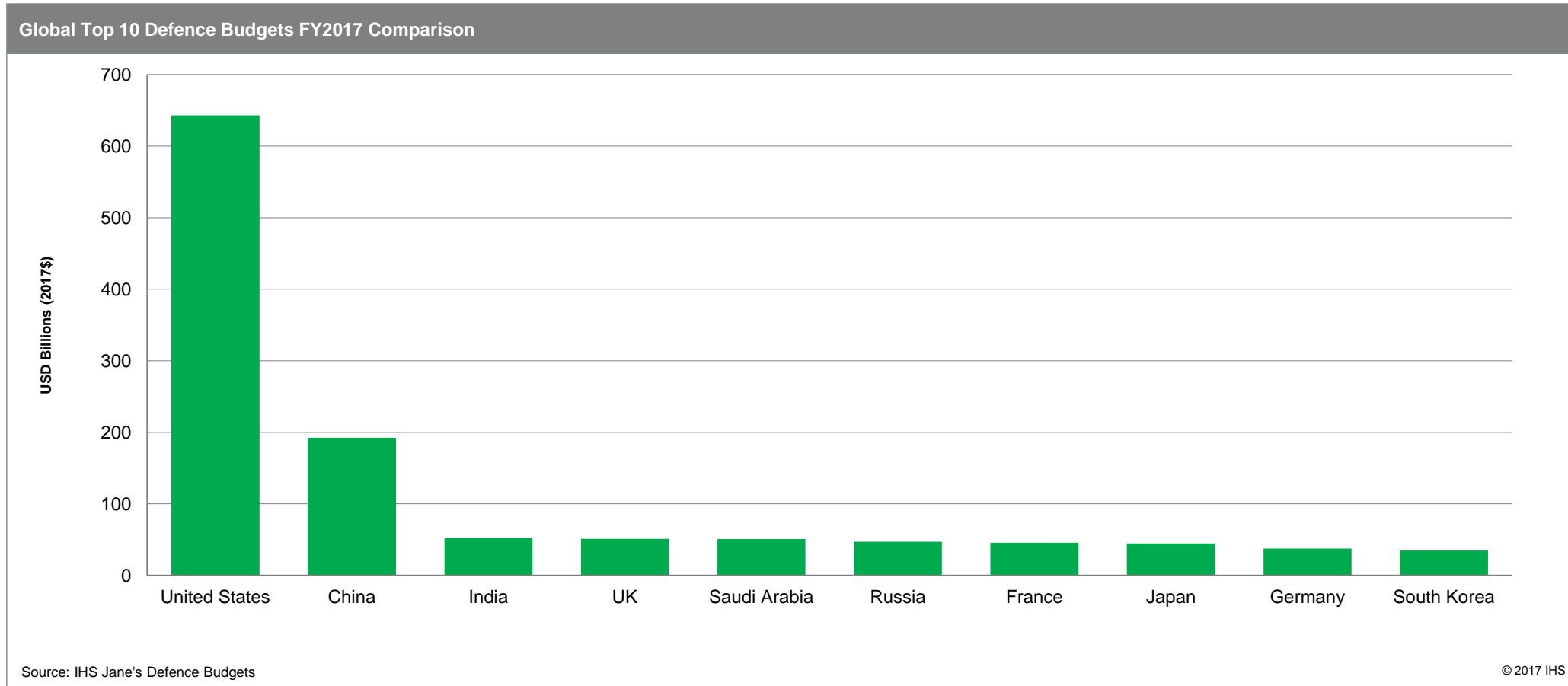
## How do we forecast the next 5 years in practice?

- **Start from the current base year data (2016) collected from questionnaire returns**
- **Apply a growth trend by product type/ form factor based on historical data and views expressed in industry supplier interviews**
- **Apply composite trends from IHS Markit data sources :**
  - **GDP growth by country by year (IHS Markit data)**
  - **Industry sector growth by country by year (Janes Defence, IHS Markit Factory automation data)**
  - **Test outputs with the industry (let's hear your views!)**

## Reviewing product trends



# Global Top 10 Country Defence Budgets (Janes)



- India moved from #4 position into #3 position, exchanging with the UK
- Rest of the countries maintained position from 2016

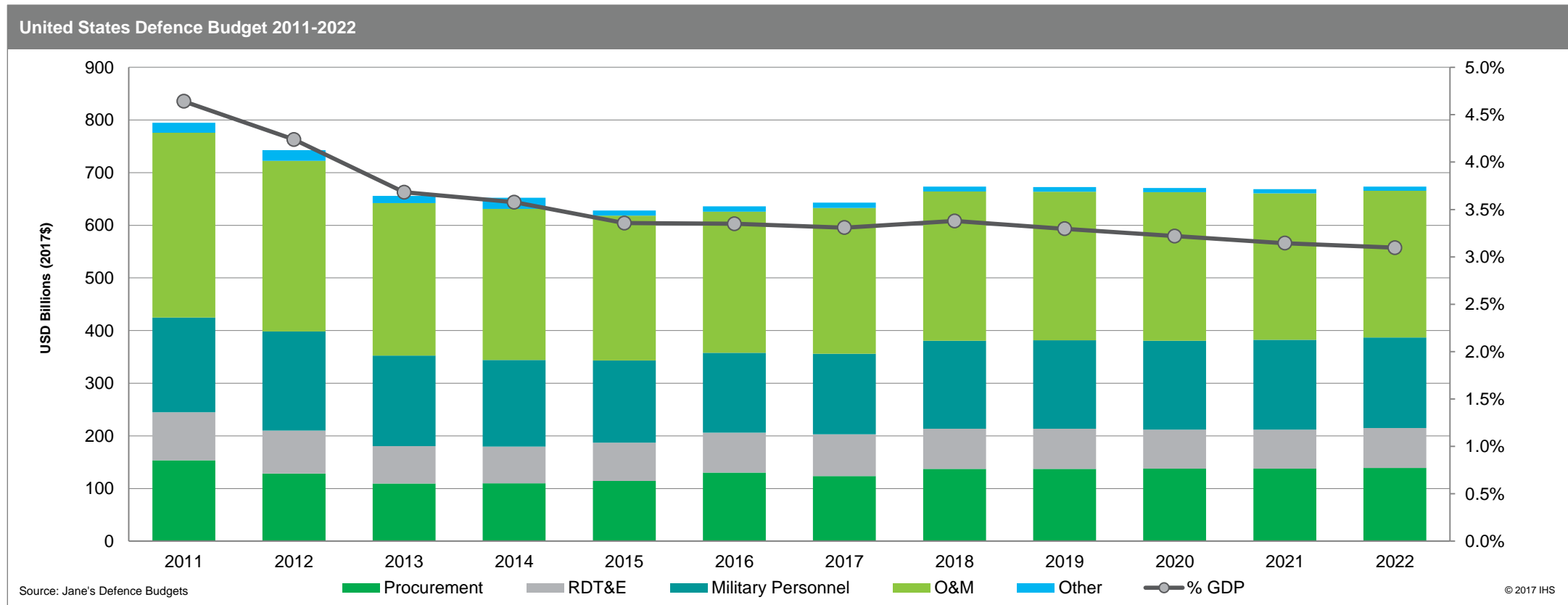
**Top 10 Countries = 74.3% of Global Defence Budget**



## **Expectations for the US economy and defence budget in 2018**

- 1. Economy gaining strength – but debt keeps rising**
- 2. Defence budget increasing**
- 3. Globe's largest defence investment budget being maintained**
- 4. Ballistic Missile Defence (BMD) plans front and center in FY18 Supplemental Budget request due to geo-political issues and a challenging security environment**
- 5. Shipbuilding funding increases continue; aircraft funding declines in FY18**
- 6. Readiness issues continue – some years away from Full Spectrum Readiness**

# United States Defence Budget by Appropriation (Janes)



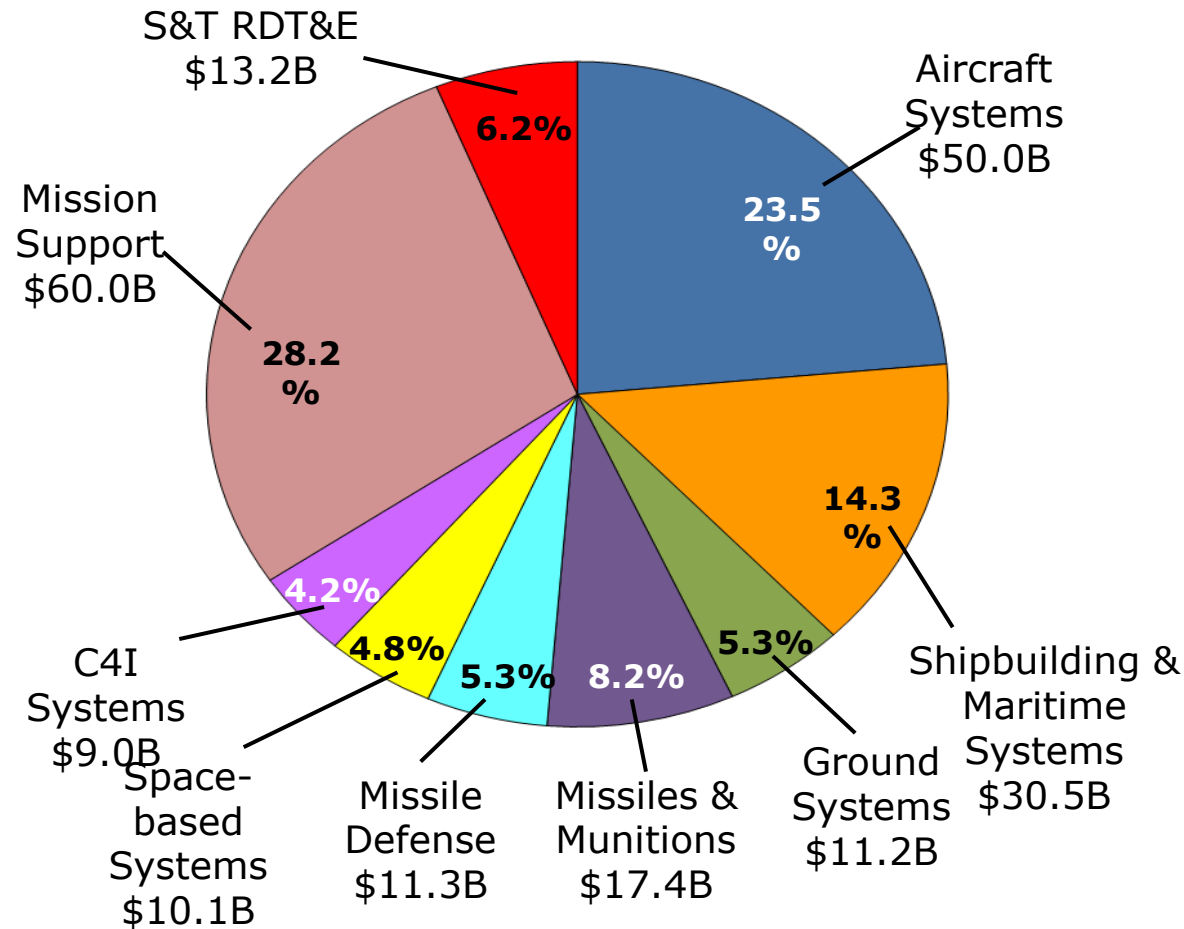
- Defence % of GDP decreasing: 4.6% in FY11 → 3.1% in FY22
- USD179 billion FY14 investment smallest in a decade – result of sequester
- Investment peaks in FY16 (32.4% of DoD); then maintains average of 31.7%

**US Defence Investment Averages 31.7% through FYDP**

# DoD FY18 Budget by Mission Category (Janes)

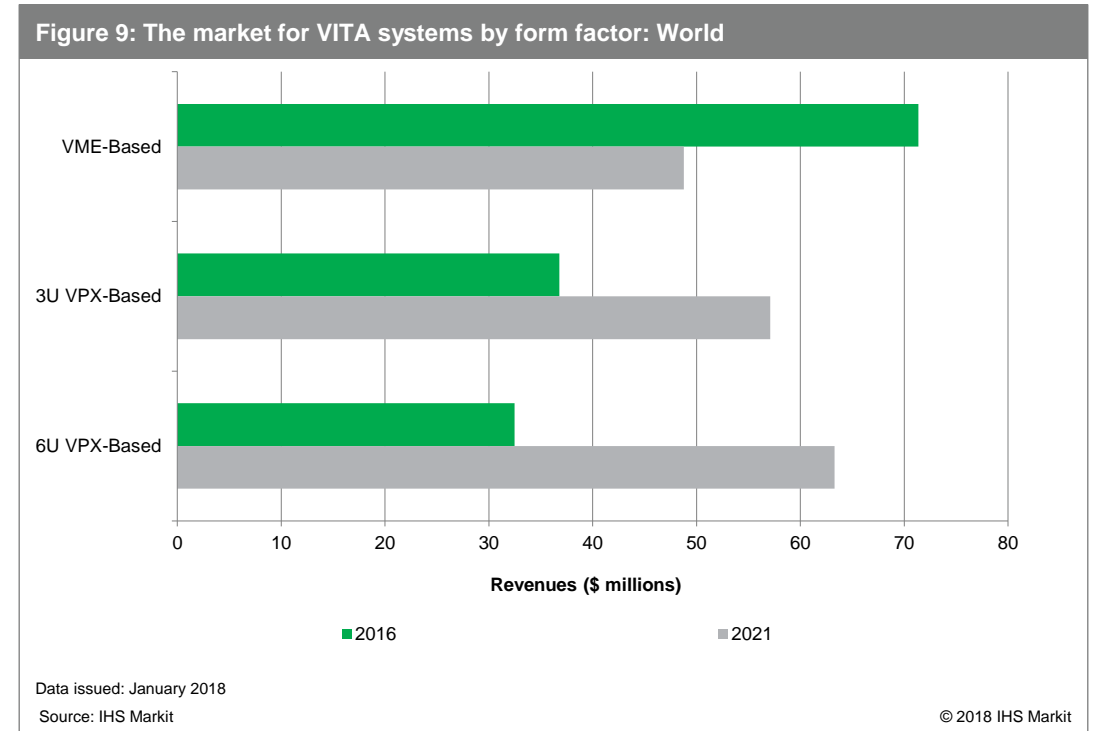
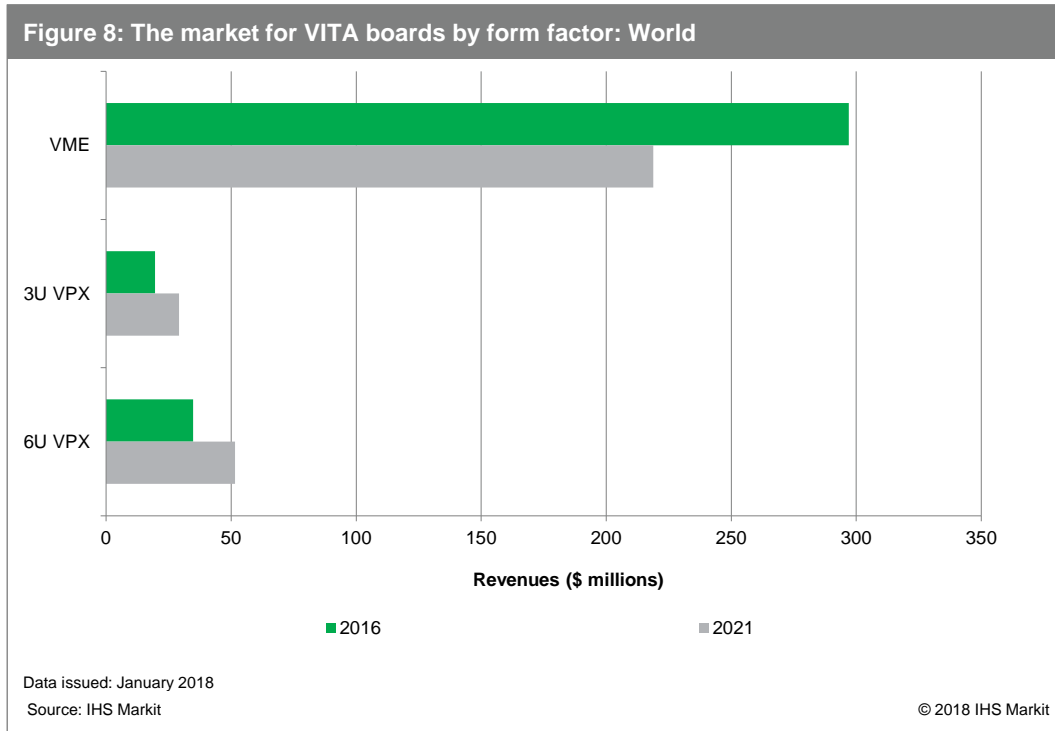
FY18 Total Base + OCO + Supplemental Budget for Modernization Accounts in Current \$ 212.6 billion

**Cyber \$8.0B distributed throughout**



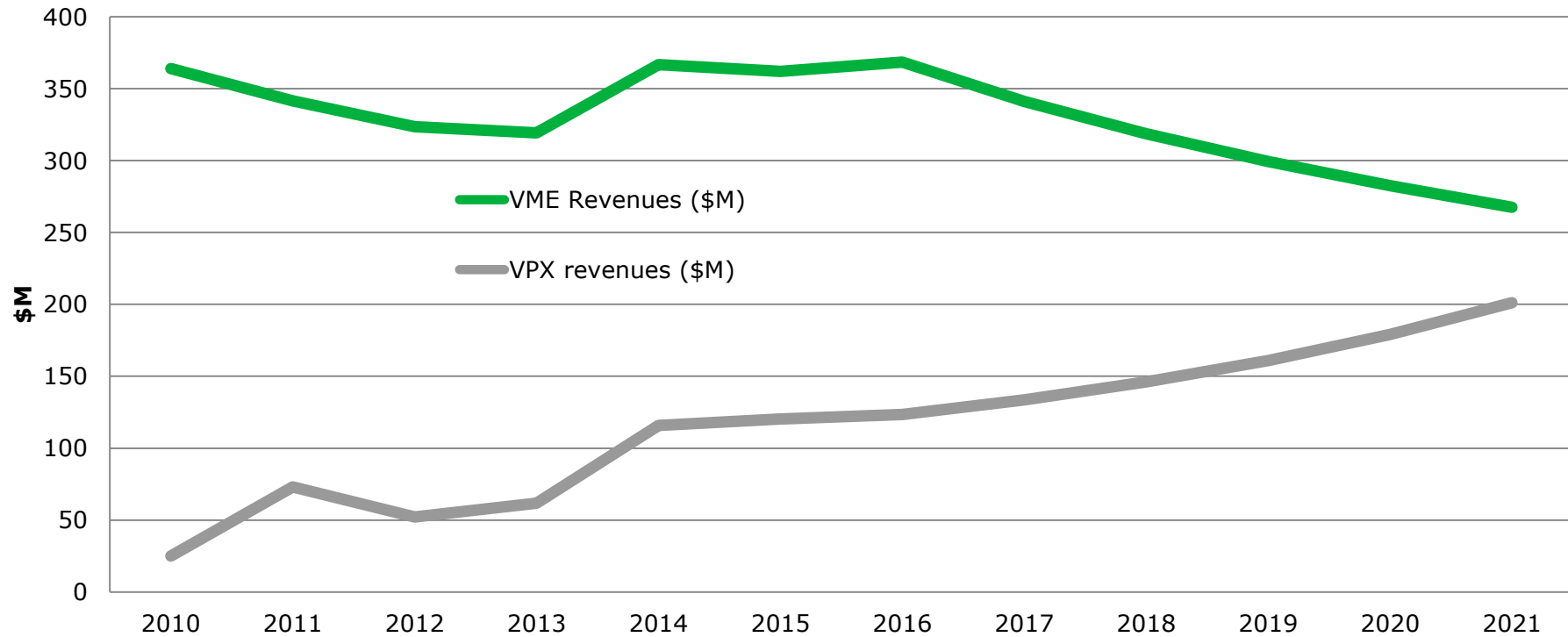
Investment in USD billion (current \$)	Base + Supple. FY18	%
<b>Weapons Category / Mission Area</b>		
Aircraft & Related Systems	50.07	23.5%
Shipbuilding & Maritime Systems	30.46	14.3%
Ground Systems	11.21	5.3%
Missiles & Munitions	17.38	8.2%
Missile Defense	11.26	5.3%
Space-based Systems	10.09	4.7%
C4I Systems	8.95	4.2%
Mission Support	60.04	28.2%
S&T RDT&E	13.20	6.2%
<b>Total</b>	<b>212.65</b>	<b>100.0%</b>
includes Procurement, RDT&E and NDSF accounts		

# Preliminary forecast of world market for VITA boards and systems by form factor to 2021 based on VME sales reducing, VPX increasing.



# Resulting VME/VPX forecast

## VME/VPX Sales Forecast



## Reviewing the forecast for VITA boards and systems

- **VME standard is “ageing well” so far.**
- **VPX seems a long way away from overhauling VME.**
- **Sales dominated by the U.S defence market so growth largely supported/constrained by the US defence budget.**
- **Niche applications in industrial automation and rail transportation markets remain relatively small and the expected growth will have little effect on total sales.**
- **Any forecast describes just one scenario from the information to hand at the time of preparation so we may need to consider alternatives and certainly review annually.**

## Other issues which may affect the forecast

- **Software-centric solutions have disrupted the xTCA market- will VME/VPX remain immune?**
- **Security is a growing issue across embedded computing and “Securely Connecting the Embedded World” was the main conference topic at Embedded World 2017.**
- **DARPA is now investigating the resilience of COTS systems. The Consec programme aims to remove “excess functionality”. Openness and security tend to pull in opposite directions!**
- **Security starts with the processor and two major flaws , code named ‘Meltdown’ and ‘Spectre’ could make the security of a large number of computers vulnerable. How will this effect COTS systems already deployed?**
- **Threats of new disruptive technologies (e.g. Quantum Computing/ AI) are not yet impacting but grow as key companies invest in developing capabilities.**
- **Unknown unknowns always represent a challenge!**

**What's your view?**



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