MSU's GRANT METRICS

Farin Kamangar, MD, PhD, CRA

Division of Research and Economic Development

MORGAN STATE UNIVERSITY

GROWING THE FUTURE
LEADING THE WORLD

Outline

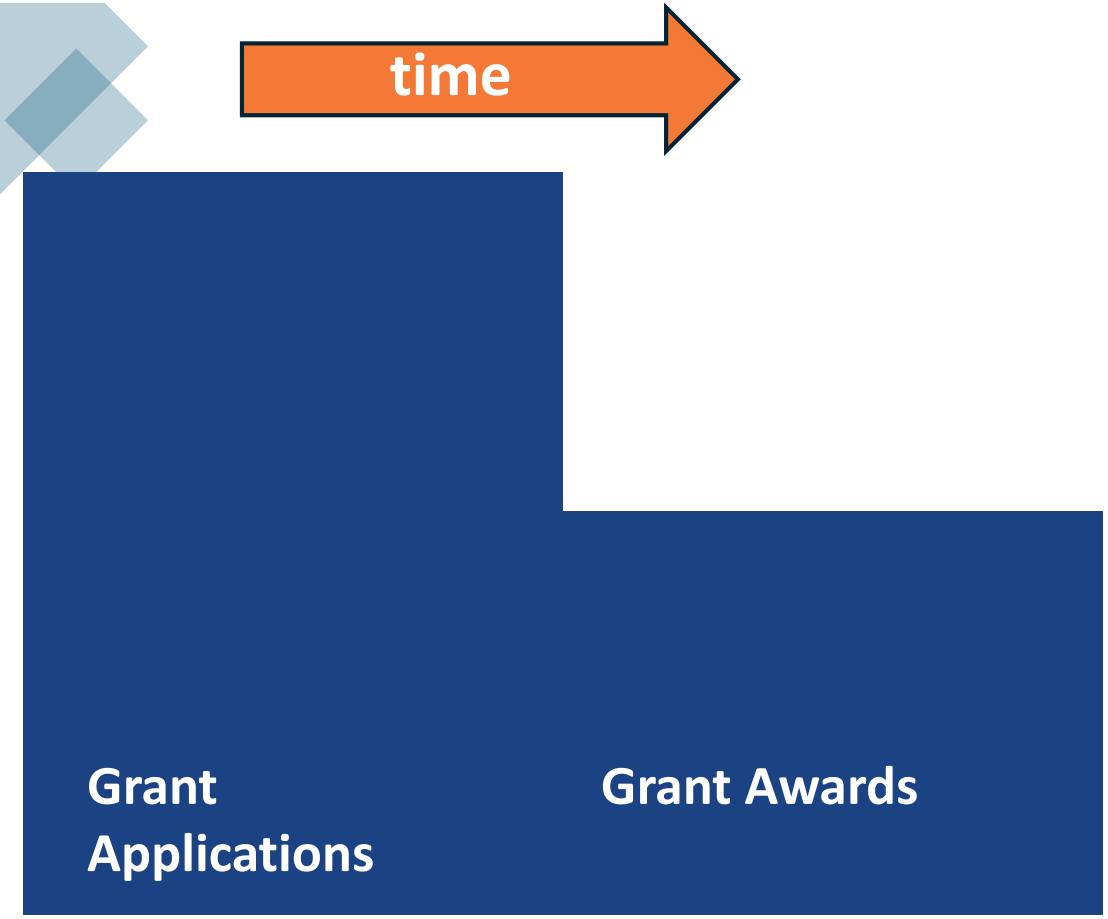
- Overview of grant metrics
- Growth over the past 15 years
- Growth in direct vs. F&A
- Growth in funding agencies
- Success rates
- Growth projections
- How can we do better?

Overview of Grant Metrics

Grant Metrics

- Grant applications (submissions)
  - Number
  - Dollar amount
- Grant awards
  - Number
  - Dollar amount
- Grant-funded expenditures
  - Dollar amount
- R&D expenditures
  - Dollar amount

Grant Applications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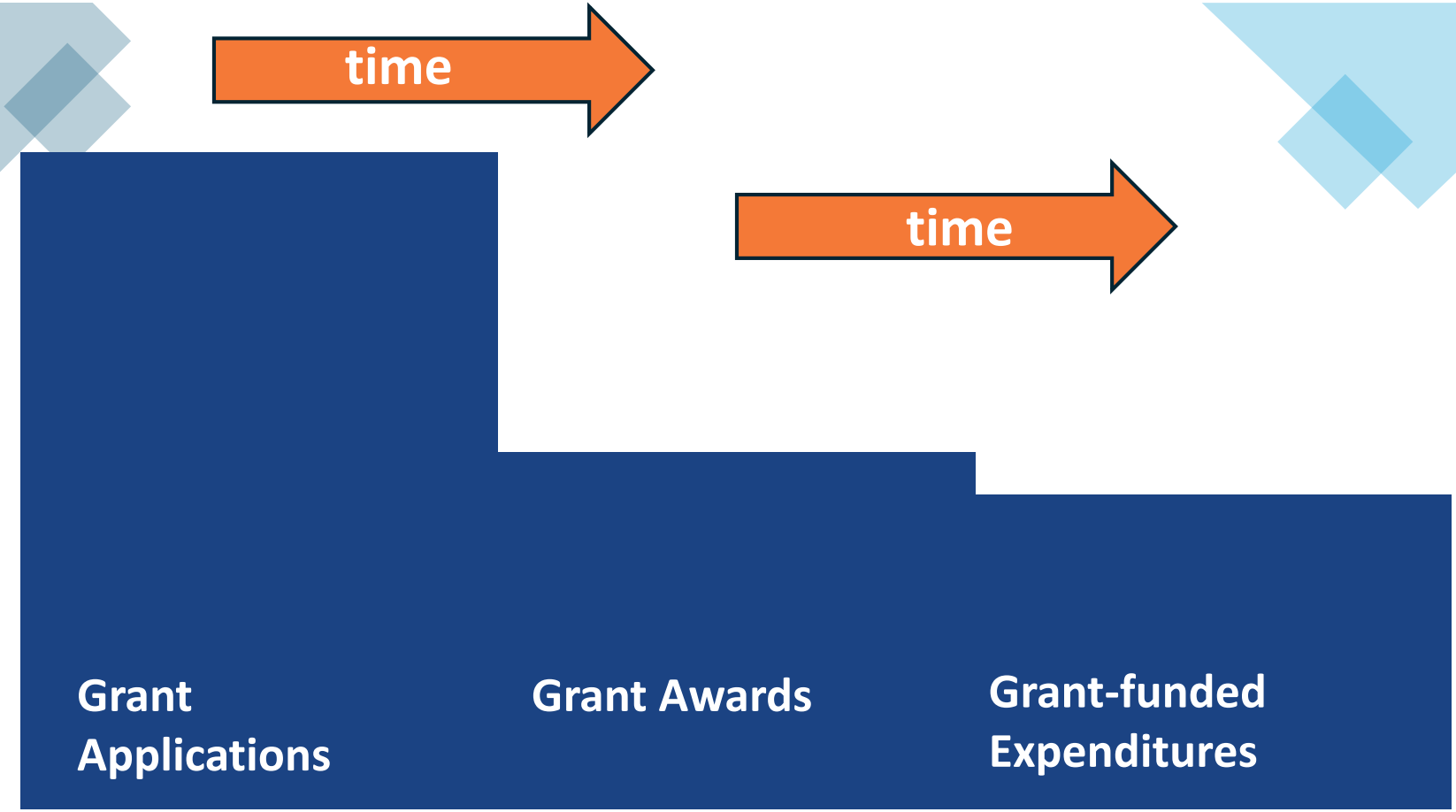
Grant Applications
Grant Awards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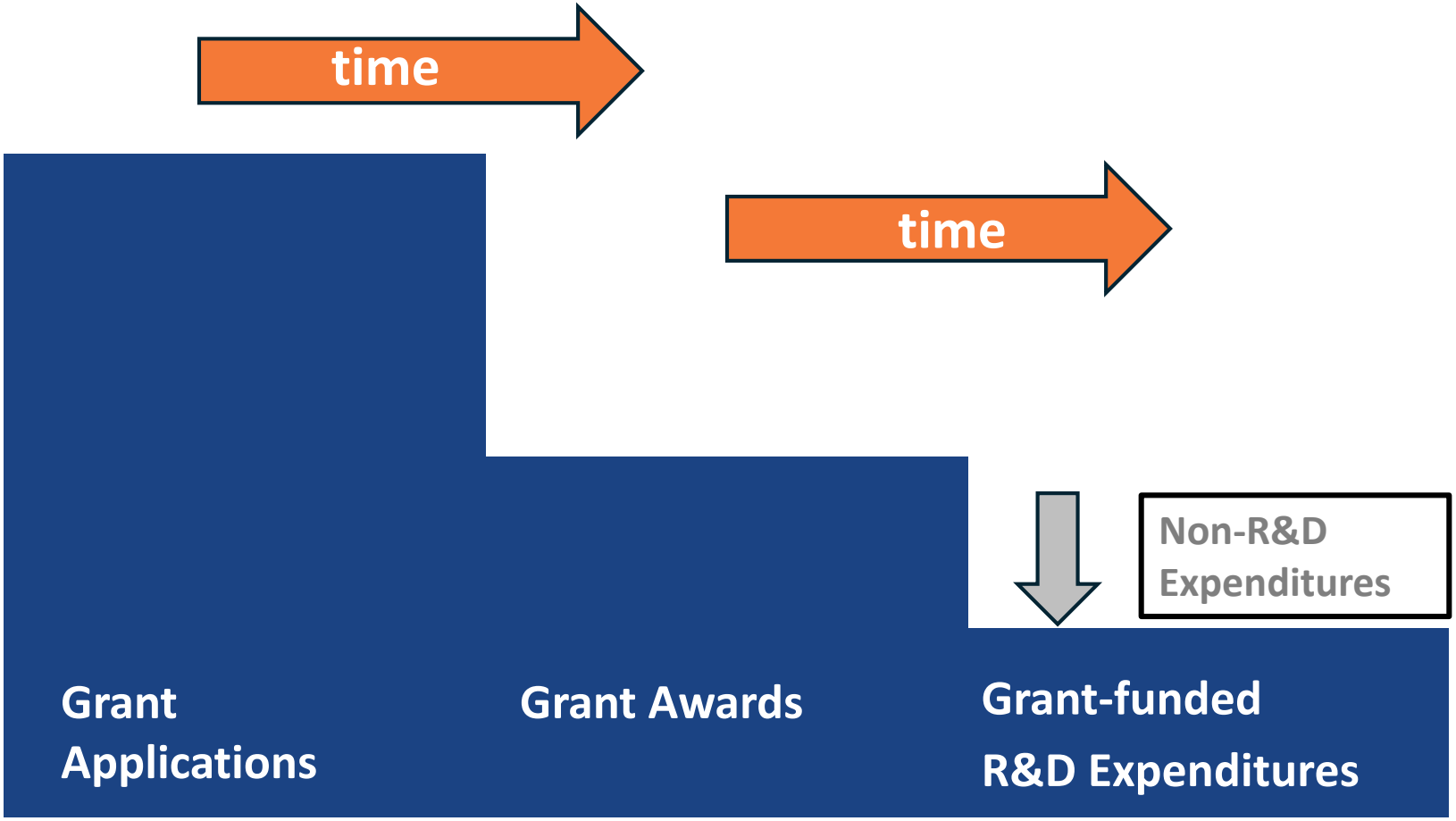
Grant Applications
Grant Awards
Grant-funded Expenditures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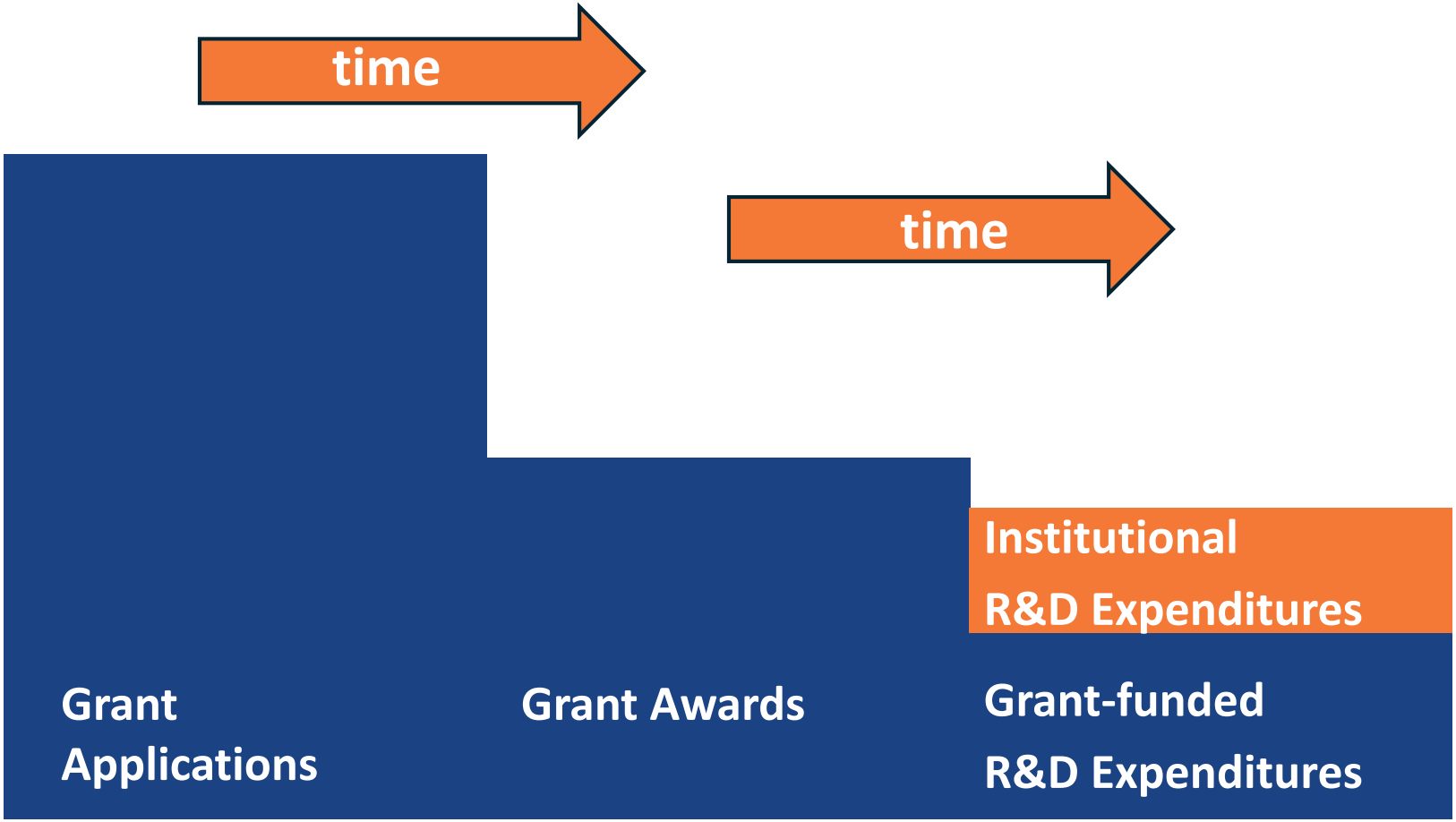
Non-R&D Expenditures
Grant Applications
Grant Awards
Grant-funded R&D Expenditures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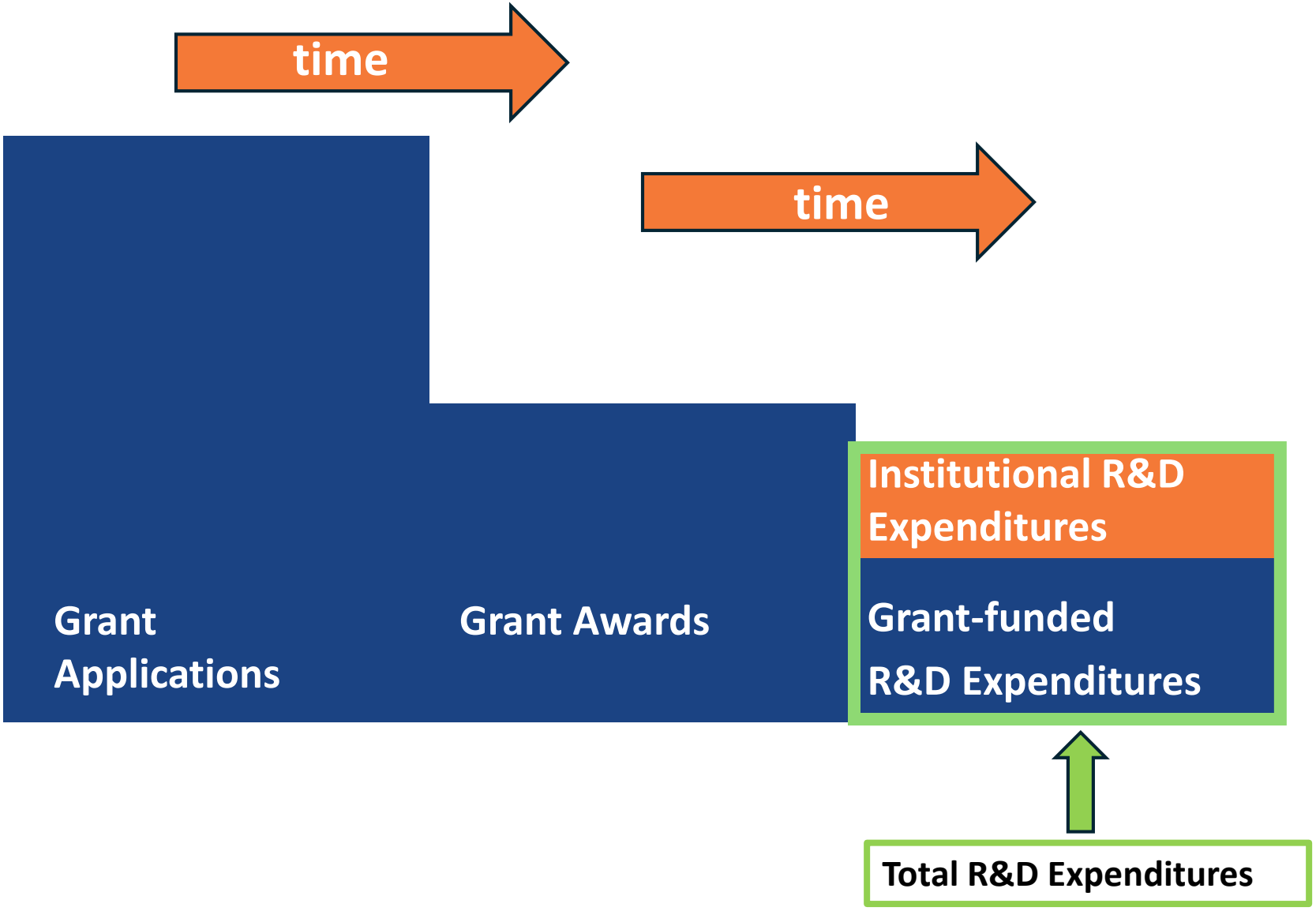
Institutional
R&D Expenditures
Grant
Applications
Grant Awards
Grant-funded
R&D Expenditures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Grant Applications
Grant Awards
Institutional R&D Expenditures
Grant-funded R&D Expenditures
Total R&D Expenditures

Summary

- It is important to clearly state what grant metric we are looking for. There are major differences between:
  - Grant awards
  - Grant-funded expenditures
  - R&D expenditures (= grant R&D + institutional R&D)
- There is a time lag between grant applications, grant awards, and grant expenditures.
- For the purposes of achieving R1, NSF HERD only counts R&D expenditures (from grants + institutional).
- However, at Morgan, we care about all expenditures. Grant that help our students or community, even if not R&D, are very important to us.

[ORA] Vote NOW for your favorite Grant-Related Success Story

Inbox ×

ORA-announcements
to ORA-announcements

Wed, Sep 4, 11:08 AM (5 days ago)

We asked, and you answered! A call went out over the summer for Grant-Related Success Stories, and the Office of Research Administration (ORA) received a wonderful collection of short story submissions from across the Morgan community. The ORA selected the top four most compelling stories, each highlighting a focus on Morgan's Strategic Goals, especially Goal 1 (achieving R1 status) and Goal 5 (serving as the premier anchor institution for Baltimore City and beyond). **The selection of a winner is now in your hands.** One winner will receive a $250 cash award and have their story featured on the ORA website and in ORA presentations and communications.

Please read all four remarkable stories, and then vote for your favorite one.

We ask that you only vote once.

Voting will close Sept. 18, 2024.

Meet the nominees! (Click Here)

All the best,

Becca Steiner (she/her/hers)
Grant Administrator
Office of Research Administration
Division of Research and Economic Development

Growth Over the Past 15 Years

Numbers May Depend On…

- What data sources are used? How reliable are they?
  - General ledger (Banner)?
  - Excel?
- What grants are included?
  - Title III funds?
  - Higher Education Emergency Relief Fund (HEERF), also known as Covid funds?
  - …
- What is the definition of a new award?
  - The first notice of award?
  - Supplements?
  - Incremental funds?
- …

Sources and Reliability of Data
(FY2010 – FY2024)

- **Grant submissions** — **ORA Databases**
  - Reliable — July 1, 2020 – Now
  - Estimates — July 1, 2009 – June 30, 2020
- **Grant awards** — **ORA Databases**
  - Reliable — July 1, 2020 – Now
  - Estimates — July 1, 2009 – June 30, 2020
- **Grant-funded expenditures** — **MSU Banner**
  - Reliable — July 1, 2009 – Now
- **R&D expenditures** — **NSF HERD reports**
  - Likely an underestimate
  - Substantial improvements made over the past two years, but more work needs to be done.

Applications (#) and Awards ($)*
(The Past 5 Years)

Academic Year	Applications (#)	Awards ($)
2020	165	$34 million
2021	257	$35 million
2022	224	$76 million
2023	313	$84 million
2024	333	$88 million

- Data include Title III grants, but not HEERF grant.
- Source: ORA Databases

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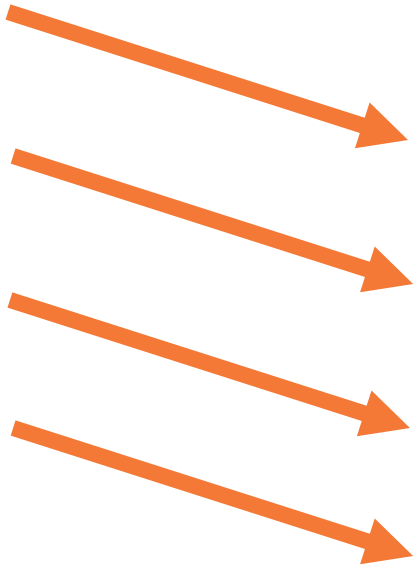


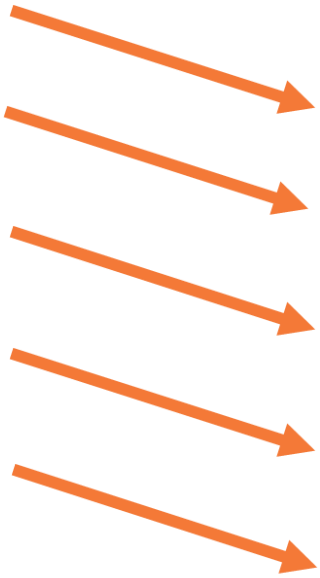
- Data include Title III grants, but not HEERF grant.
- Source: ORA Databases

5-Year Results

- Take-off in application numbers happened in FY2021.
- Consequently, we had large number of grant awards and large dollar amounts received in FY2022.
- 5-year results shows that submitting 330 proposals per year is entirely reasonable.

How Will We Do in FY2025?
(July 1, 2024 – June 30, 2025)

Academic Year	Applications (#)	Awards ($)
2020	165	$34 million
2021	257	$35 million
2022	224	$76 million
2023	313	$84 million
2024	333	$88 million
2025	???	???



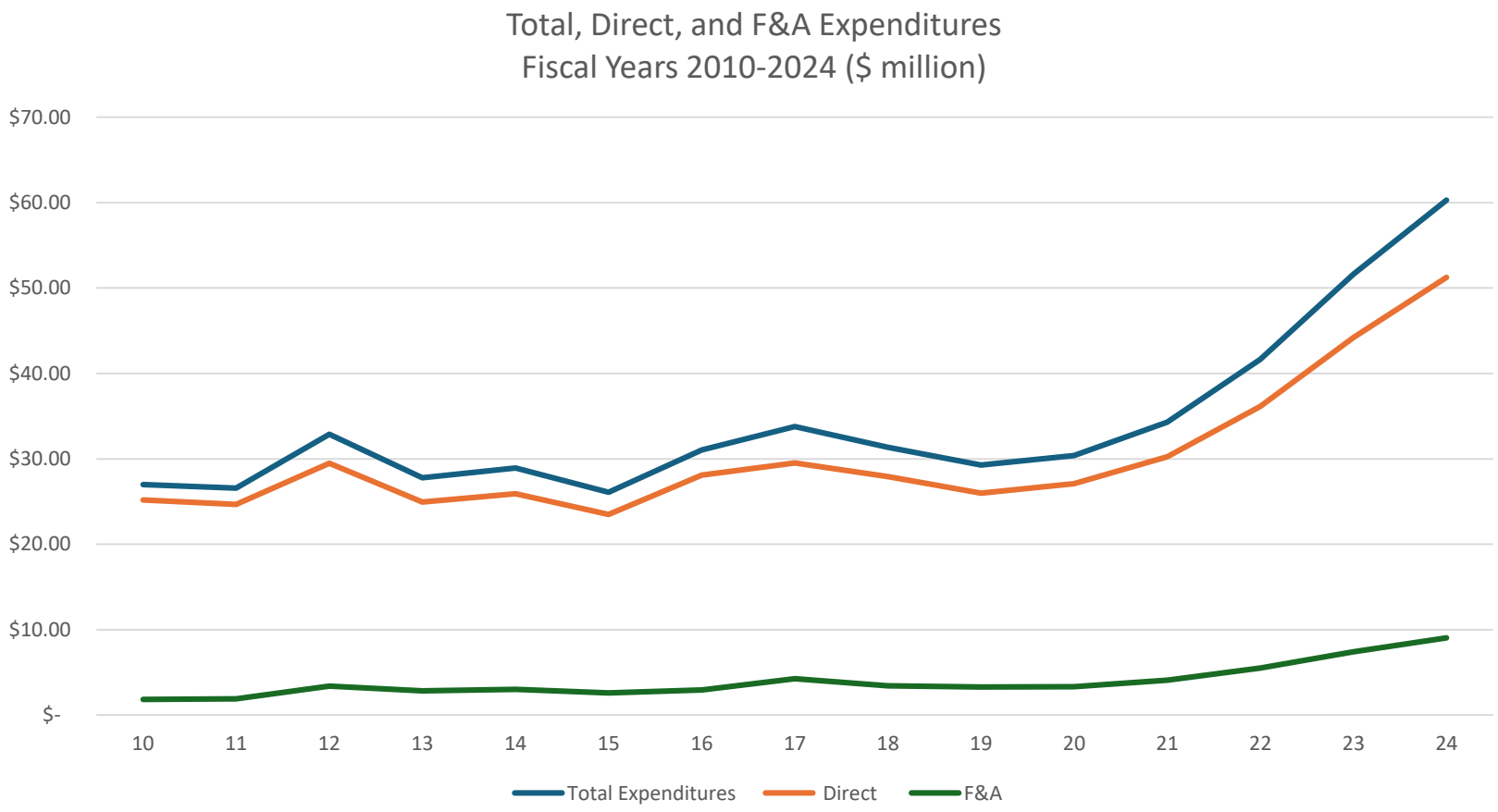
* Data include Title III grants, but not HEERF grant.

Academic Year 2025 (only 2 months)

- For FY2025, as of September 6, 2024, MSU has received 22 awards for a total of $41.4 million.

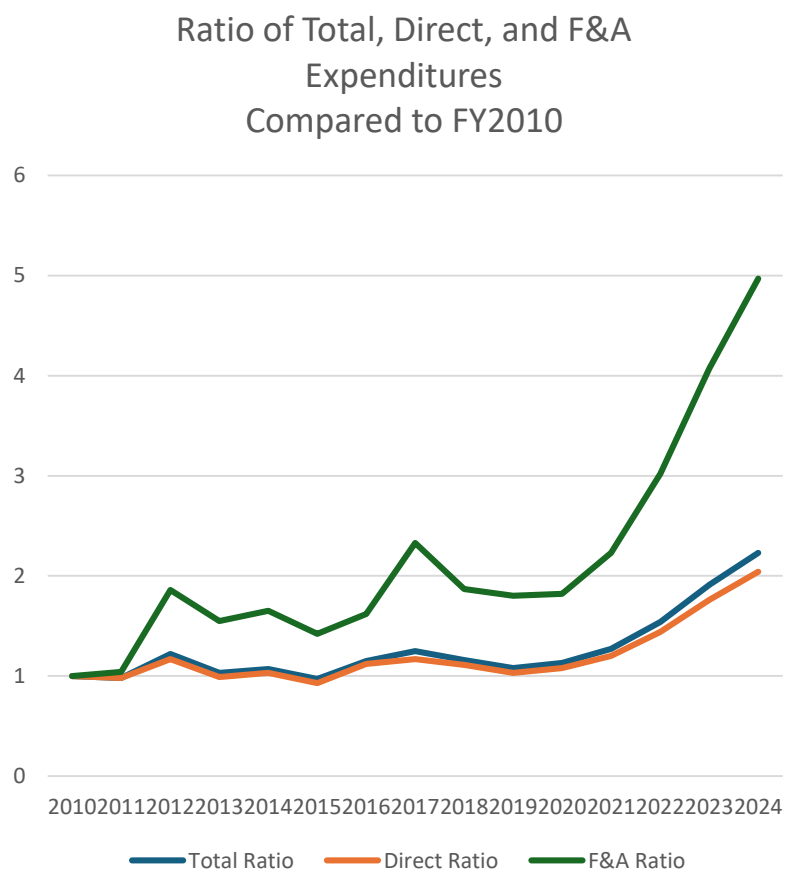
- For FY2025, as of September 6, 2024, MSU has submitted 49 proposals for a total to $37.8 million.

Grant Expenditures
Total, Direct, and F&A (FY2010 – FY2024)



Source: MSU Banner

Grant Expenditures
(FY2010 – FY2024)

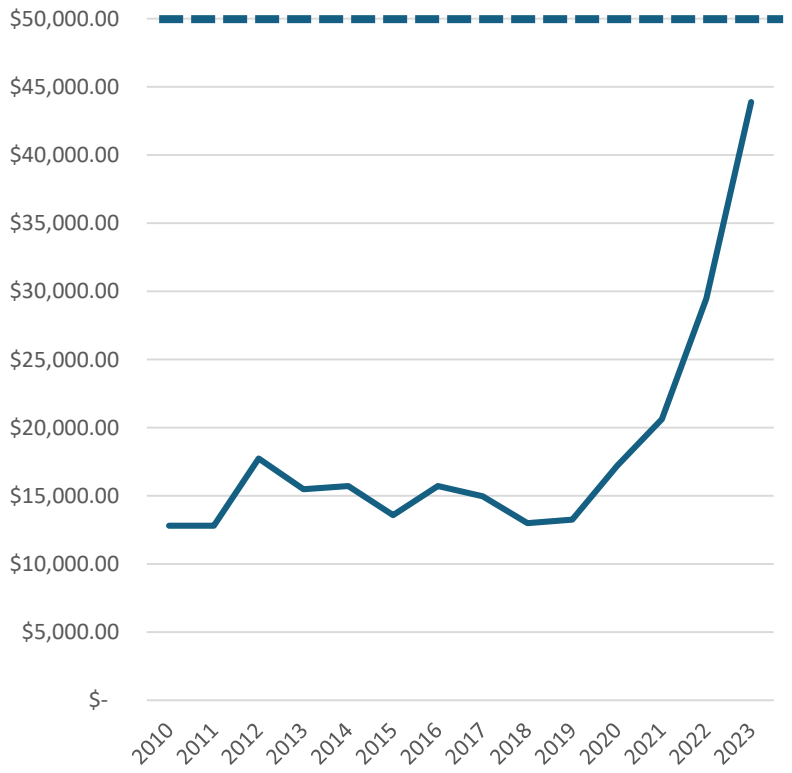


Fiscal Year	Total Expenditures	Direct	F&A
10	$ 27.00	$ 25.18	$ 1.82
11	$ 26.56	$ 24.67	$ 1.89
12	$ 32.87	$ 29.48	$ 3.39
13	$ 27.77	$ 24.94	$ 2.83
14	$ 28.94	$ 25.93	$ 3.01
15	$ 26.09	$ 23.50	$ 2.59
16	$ 31.05	$ 28.10	$ 2.95
17	$ 33.78	$ 29.53	$ 4.25
18	$ 31.36	$ 27.94	$ 3.42
19	$ 29.26	$ 25.98	$ 3.28
20	$ 30.40	$ 27.10	$ 3.31
21	$ 34.30	$ 30.23	$ 4.07
22	$ 41.64	$ 36.14	$ 5.50
23	$ 51.63	$ 44.21	$ 7.42
24	$ 60.31	$ 51.26	$ 9.05

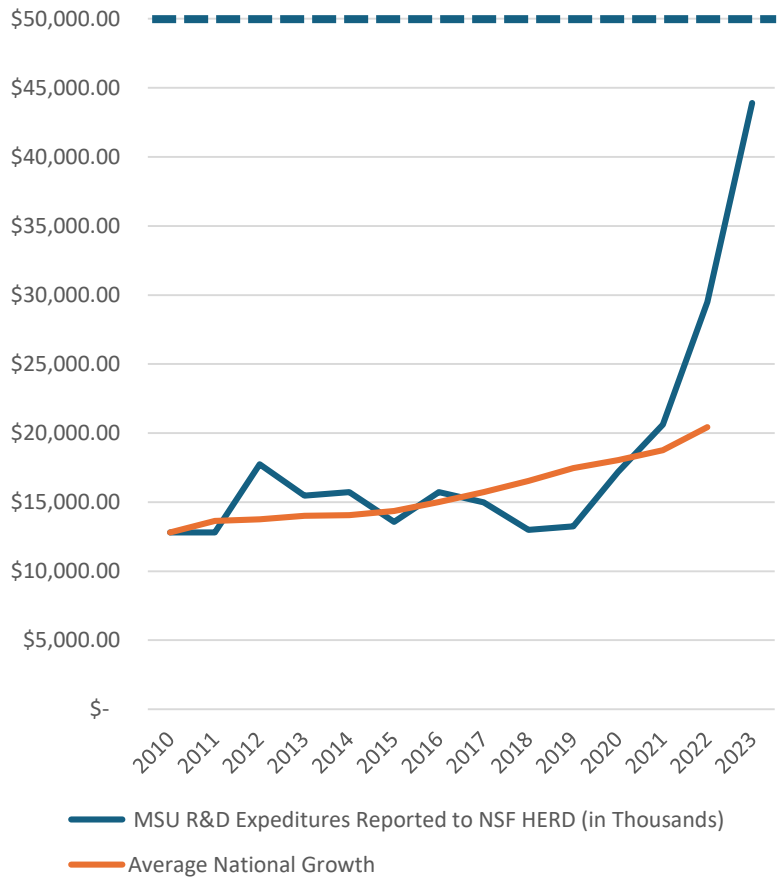
Source: MSU Banner

R&D Expenditures
(FY2010 – FY2023)

MSU R&D Expenditures Reported to the NSF HERD (in Thousands)



MSU's Growth Compared to Average National Growth



Source: NSF HERD, 2010-2022
Internal Numbers, 2023

How Will We Do for …

- **Expenditures in FY2025?**

- **R&D expenditures in FY2025?**

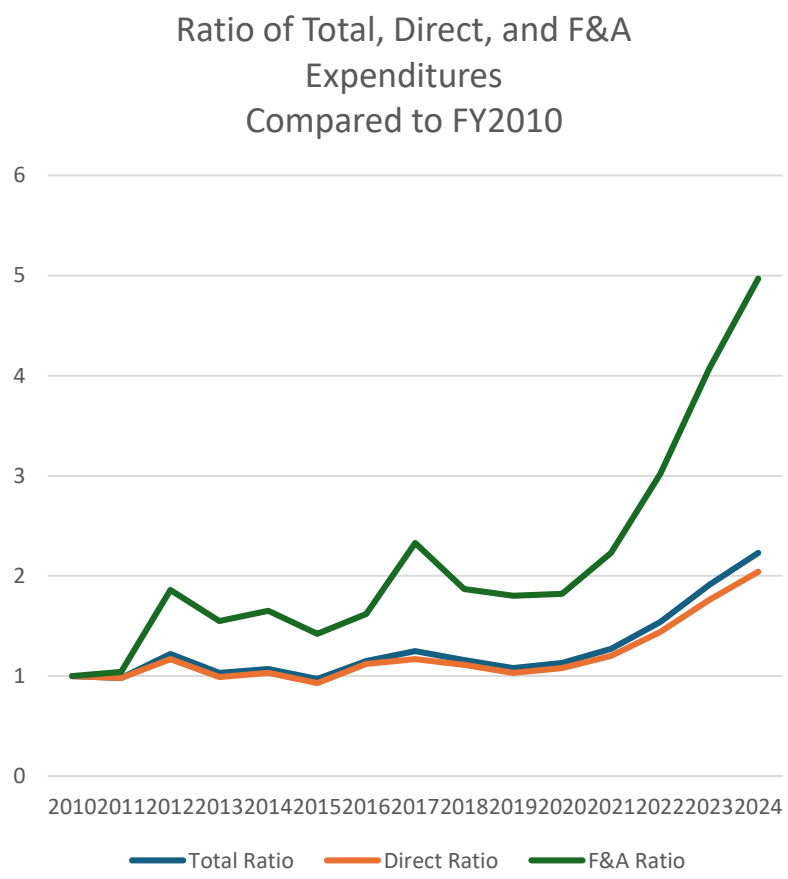
How Will We Do for …

- **Expenditures in FY2025?**
  - **We expect to do better than FY2024, because: 1) the trends show some growth; and 2) our awards have grown over the past few years. These awards will turn into expenditures in the coming years.**

- **R&D expenditures in FY2025?**
  - **We expect to do better than FY2024, because: 1) the trends show some growth; 2) our awards have grown over the past few years. These awards will turn into expenditures in the coming years; 3) a larger proportion of our awards are R&D; 4) we have more institutional expenditures, in the form of research centers; and 5) intuitional R&D expenditures are captured better.**

Growth in Direct vs. F&A

Grant Expenditures
(FY2010 – FY2024)



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22	$ 41.64	$ 36.14	$ 5.50
23	$ 51.63	$ 44.21	$ 7.42
24	$ 60.31	$ 51.26	$ 9.05

Source: MSU Banner

Direct vs. F&A

- Proportionally, F&A has grown most: almost 5 times in 15 years.

- This is mostly because:
  - Almost $10 million (40%) of the grants that we received in 2009 were from Title III, which had no F&A;
  - We also had substantial amounts of training grants, with only 8% F&A.

- Our recent grants are more likely to be research, and hence receive the full F&A rate.

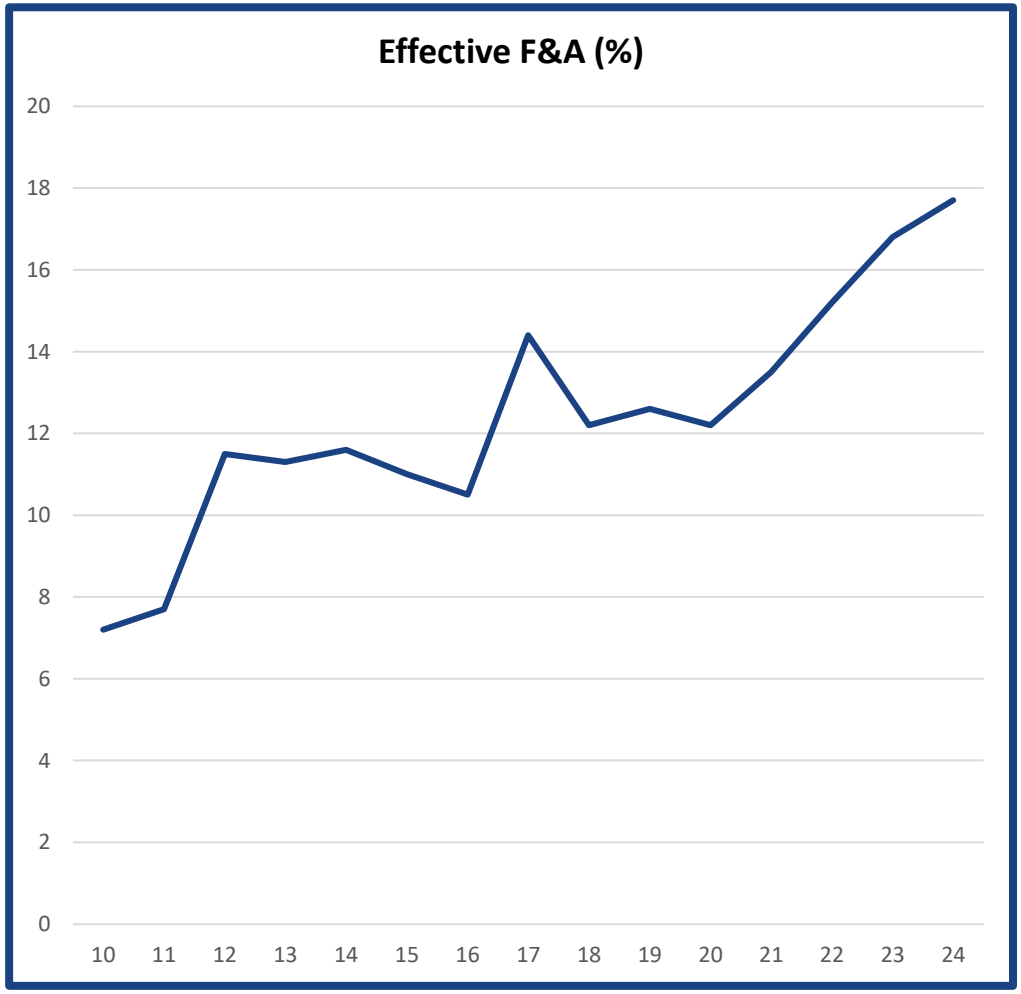
MSU's Current F&A Rates

- **On-Campus, Research: 53%**
- **On-Campus, Other Sponsored Activities: 42%**
- **Off-Campus: 26%**

- **The real (effective) F&A is much lower, because:**
  - **Some grants (e.g., Title III) receive no F&A.**
  - **Some grants receive (e.g., NIH training grants) receive only 8%.**
  - **Some foundations have a cap (e.g., 20%) on their F&A.**
  - **State of Maryland may pay less (e.g., 10%).**
  - **F&A is not applied to equipment, constructions, participant support costs, …**
  - **…**

Effective F&A Rates
(F&A / Total Direct Costs)

Fiscal Year	Effective F&A (%)
10	7.2
11	7.7
12	11.5
13	11.3
14	11.6
15	11
16	10.5
17	14.4
18	12.2
19	12.6
20	12.2
21	13.5
22	15.2
23	16.8
24	17.7



Growth in the Diversity of Funding Agencies and Collaborators

Funding Agencies
(Over $1 million, from FY2021 to FY2024)

Agency	Amount (millions)
U.S. Department of Education (DoED)	$ 56.09
National Aeronautics and Space Administration (NASA)	$ 38.04
National Science Foundation (NSF)	$ 36.44
U.S. Department of Transportation (DoT)	$ 23.68
U.S. Department of Defense (DoD)	$ 21.46
U.S. Department of Health and Human Services (non-NIH)	$ 16.86
U.S. Department of Commerce (DoC)	$ 10.60
U.S. Department of Energy (DoE)	$ 7.02
Maryland Department of Transportation (MDoT)	$ 4.85
National Institutes of Health (NIH)	$ 4.41
Baltimore City Department of Health (BCDH)	$ 1.96
Maryland Department of Health (MDoH)	$ 1.56
National Security Administration (NSA)	$ 1.18

Funding Agencies
(Over $1 million, FY2022 and FY2024)

Funding Agency	FY2022
NASA	$ 28.8
Department of Education	$ 13.6
Department of Defense	$ 8.0
National Science Foundation (NSF)	$ 7.4
National Institutes of Health (NIH)	$ 2.8
Department of Commerce	$ 1.5
Department of Health	$ 1.5
Department of Transportation	$ 1.0

Funding Agency	FY2024
Department of Education	$ 18.2
Department of Health	$ 14.1
National Science Foundation (NSF)	$ 10.8
Department of Defense	$ 8.7
Department of Commerce	$ 5.2
Department of Transportation	$ 5.1
MD Department of Transportation	$ 4.2
NASA	$ 3.4
Department of Energy	$ 1.6
National Institutes of Health (NIH)	$ 1.5
MD Department of Health	$ 1.3

Diversity of Collaborators

HUB EVENTS AT WORK JOHNS HOPKINS MAGAZINE JHU.EDU

HUB

JOHNS HOPKINS UNIVERSITY

ARTIFICIAL INTELLIGENCE

Johns Hopkins to partner with Morgan State for AI-driven microelectronics training

A $2.7 million NSF grant will launch a program to train a diverse graduate-student workforce to revolutionize semiconductor and microelectronics processing

Emily Flinchum / Sep 6

Diversity of Funding Agencies

- We receive funding from many agencies.
- The large majority of our grant funding comes from federal agencies.
- The diversity of funding agencies is on the rise.
- The number of universities that act as passthroughs and give subawards to Morgan is on the rise (data not shown).

Success Rates

Applications:
Number (#) and Requested Amount ($)

Academic Year	Number (#)	Requesting ($)
2021	257	$155 million
2022	224	$177 million
2023	313	$358 million
2024	333	$227 million
2025 (two months)	49	$38 million
Total	1,176	$955 million

- Data include Title III grants, but not HEERF grant.
- Source: ORA Databases

Awards:
Number (#) and Amount ($)

Academic Year	Number (#)	Amount ($)
2021	114	$33 million
2022	136	$76 million
2023	166	$84 million
2024	160	$88 million
2025 (two months)	22	$41 million
Total	598	$322 million

- Data include Title III grants, but not HEERF grant.
- Source: ORA Databases

Success Rate:

N > 50%

$ > 33%

Notes About Success Rate

- Comparing the two previous tables does not give us exact success rates, because:
  - There is a lag between applications and awards.
  - Status of some of the applications is undetermined.

- The numbers presented here (50% for N and 33% for $) are likely to be underestimates.

Growth Projections

How Do We Project?

- "Prediction is very difficult, especially if it's about the future."
  - Werner Heisenberg

- Projections are based on:
  - Growth trends over the past 15 years
  - Growth trends over the past 5 years
  - Current trends and processes (e.g., hiring new faculty, training, etc.)
  - Regression models

Steady Increases
(5-Year Periods)

Period	Applications/year	$ Awards/year
2009 – 2013*	~100	~$28 million
2014 – 2018*	~150	~$33 million
2019 – 2023	~220	~$53 million

* Data are based on best estimates, not exact numbers.

Steady Increases
(5-Year Periods + Projection)

Period	Applications/year	$ Awards/year
2009 – 2013*	~100	~$28 million
2014 – 2018*	~150	~$33 million
2019 – 2023	~220	~$53 million
2024 – 2028	~330	~$90 million

* Data are based on best estimates, not exact numbers.

Applications (#) and Awards ($)
(The Past 5 Years)

Academic Year	Applications (#)	Awards ($)
2020	165	$34 million
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- Source: ORA Databases

Applications (#) and Awards ($)

(The Past 5 Years + Projection)

Academic Year	Applications (#)	Awards ($)
2020	165	$34 million
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2025	330	$90 million

Current Trends and Processes

- MSU is hiring more research-oriented faculty members.
- MSU is providing requisite training and resources for new faculty members.
- A culture of research is being established.
- MSU is providing better grant management support.
- Federal agencies have increased their programs for HBCUs.
- But …

How Can We Receive $90 Million Per Year?

- Many average size grants + Title III + a few large ones.

- Many average size grants (≈ $50M)
  - 330 applications, 50% success rate = 165 awards
  - 165 x $300K ≈ $50 M

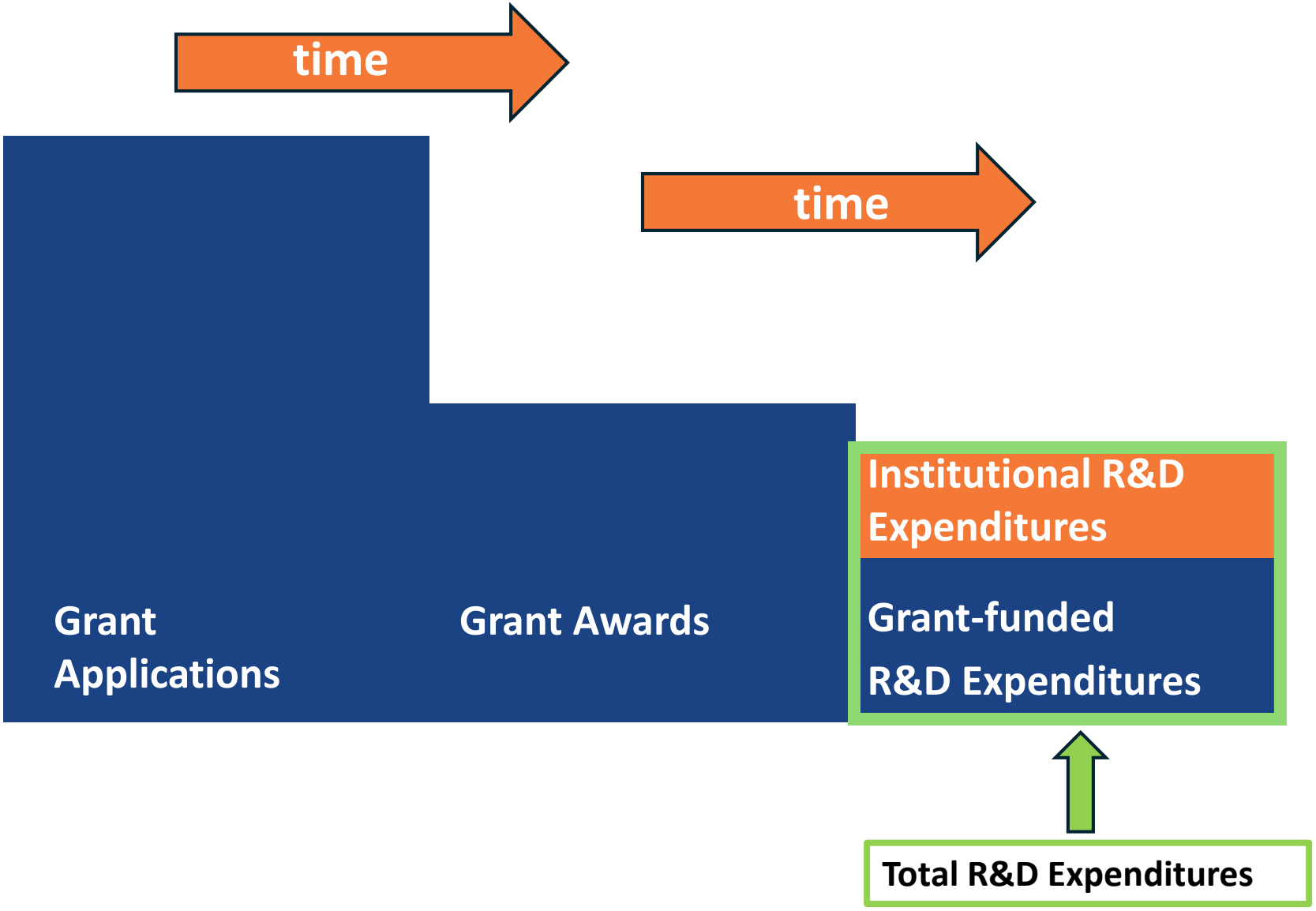
- Title III (≈ $14M)

- A few large ones (≈ $30 M)
  - 3 x $10 M

Major Awards
(Since FY2010)

- GESTAR ($69M, NASA)
- ASCEND ($40M, NIH)
- RCMI ($35M, NIH)
- 2D Materials ($16M, DoD)
- SMARTER ($15M, DoT)
- Maternal Health ($11M, HRSA)
- Equitable AI ($9M, DoD)
- CREST Center ($5M, NSF)
- Collaborative IFL ($5M , DoE)

Will We Reach R1?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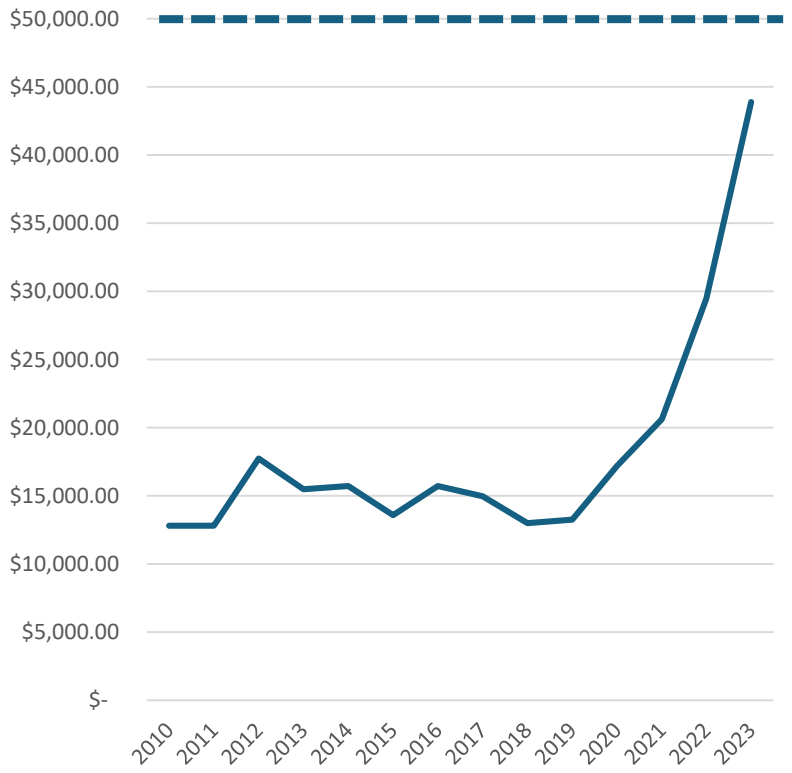
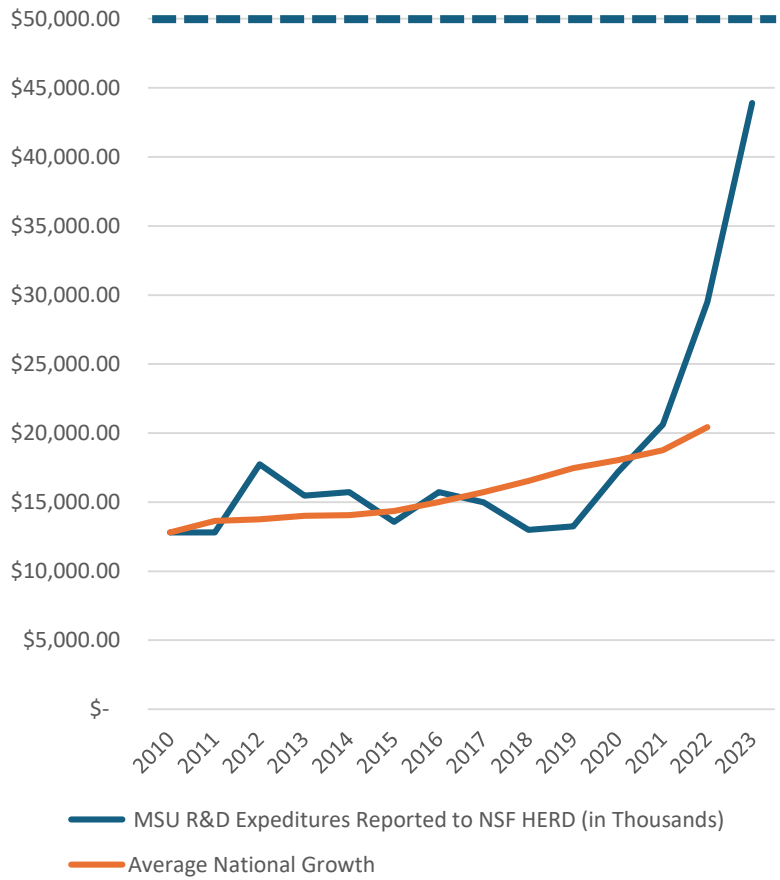
R&D Expenditures
(FY2010 – FY2023)

MSU R&D Expenditures Reported to the NSF HERD (in Thousands)



MSU's Growth Compared to Average National Growth



Source: NSF HERD, 2010-2022
Internal Numbers, 2023

Current Criteria for Achieving R1

- Average of three years:
  - At least $50 million on R&D expenditures.
    - $150 million over three years
  - Graduating at least 70 research doctorates.
    - 210 over three years

- Note:
  - These numbers may change.
  - Criteria may change in other ways.

R&D Expenditures

- The part that is relevant to this presentation is R&D Expenditures of $50 million.

- Our FY2023 numbers reported to HERD was close to $44 million. This number will likely increase for reasons discussed before.
    - Increasing grant expenditures
    - Higher proportion of R&D
    - Increasing institutional R&D expenditures
    - Capturing institutional R&D expenditures more effectively

How Can We Do Better?

How Can We Do Better? (1)

“It takes a university to raise a grant.”

Anonymous

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LEADING THE WORLD

How Can We Do Better? (2)

- Success in enhancing and strengthening our research enterprise depends on all offices in this university:
  - President
  - Division of Academic Affairs
    - Provost, deans, and chairs
    - Office of International Affairs
  - Division of Research
    - ORA, etc.
  - Division of Finance and Administration
    - RFA, HR, Procurement, Comptroller
  - Internal Audit
  - Office of the General Counsel
  - IT services
  - …

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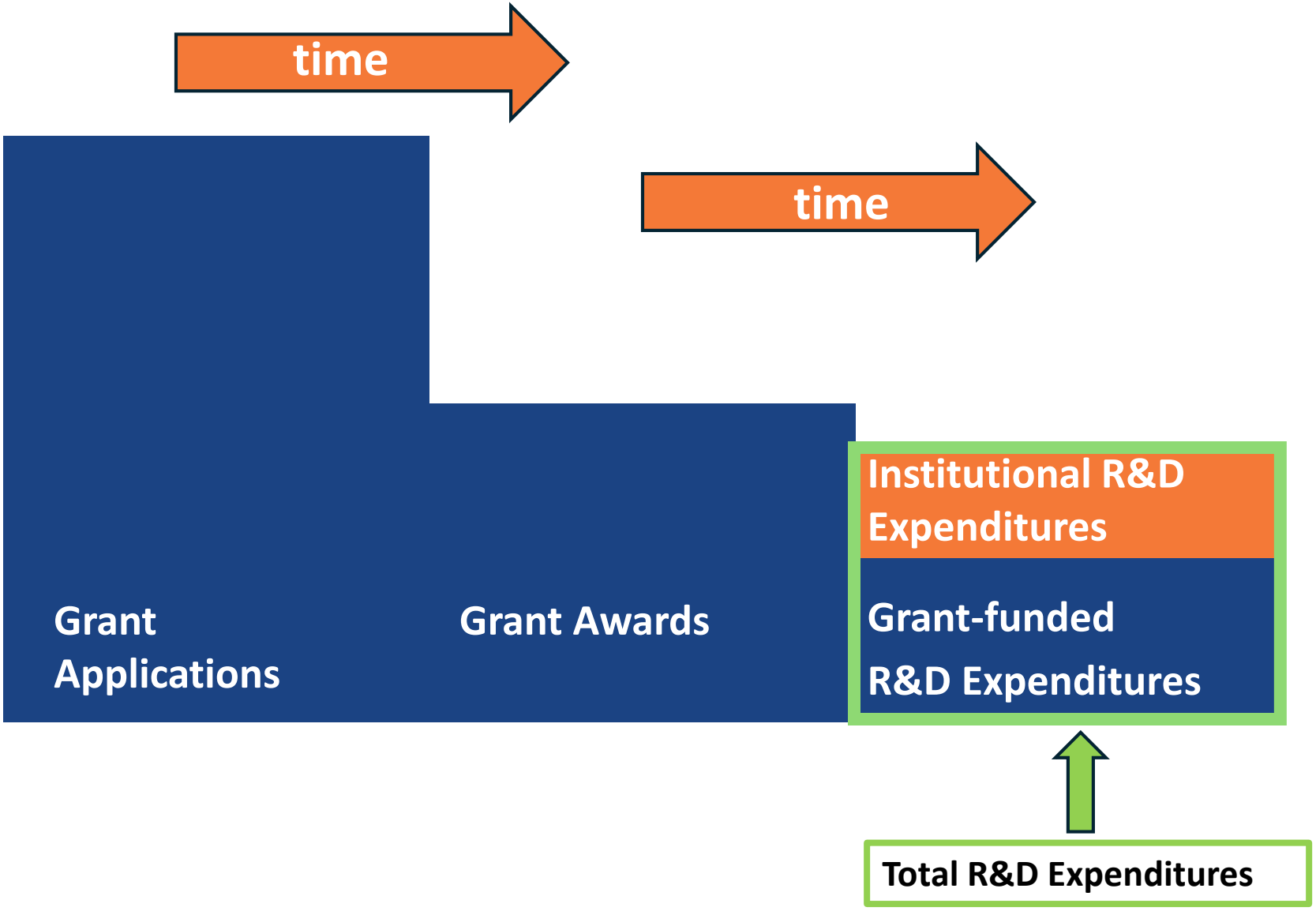
LEADING THE WORLD

How Can We Do Better? (3)

- President, VP for Research
  - Advocacy for research centers, large grants
- Provost, deans, chairs
  - Hiring research-oriented faculty members
  - Instituting incentives for research
- D-RED
  - Providing training
  - Efficient and smooth submission of grants
- Finance & Administration
  - HR: Hiring grant-funded staff quickly
  - Procurement: Procuring goods and services efficiently
  - Office of the Comptroller: Travel processes
  - RFA: Invoicing
- International Affairs
  - Visas (J1, H1-B, O1)

How Can We Do Better? (4)

- Internal Audit + General Counsel
  - Improving compliance, without a substantial slowdown in activities
- D-RED + Finance
  - Quick set of awards
- Finance + IT
  - Quick access to funds in Banner
- Provost + D-RED + Finance
  - Better capturing institutional R&D expenditures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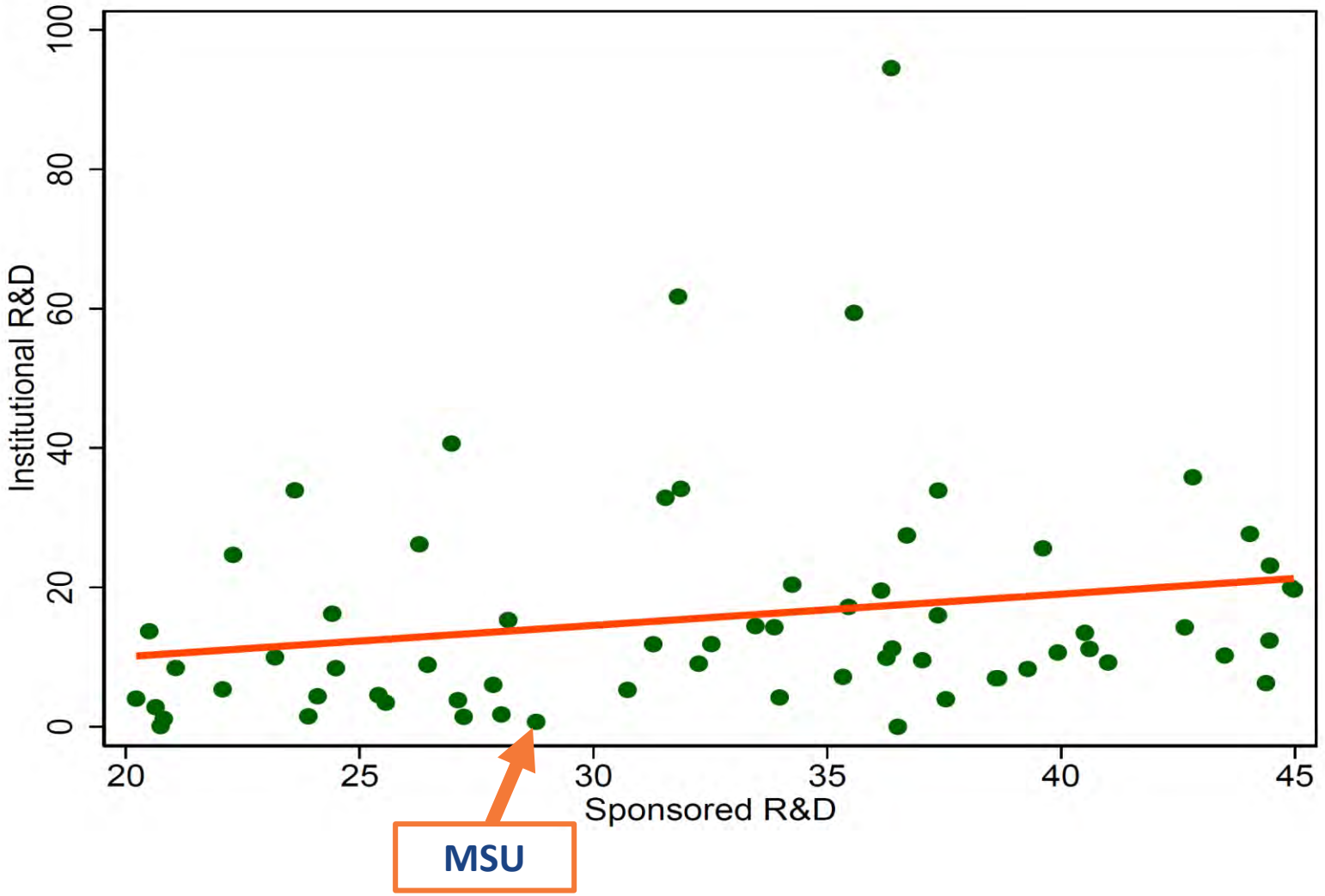
Total R&D Expenditures

MSU's FY2022 NSF HERD Report

Compared to Peer Institutions



Better Capturing of Institutional R&D Support (1)

- An analysis of FY2022 HERD data shows that for universities whose grant-funded R&D expenditures were similar to ours, the "average" institutional R&D expenditure was predicted using this formula:

Institutional = (0.45 x External) + 1 million

- We reported nearly $29 million of grant-funded R&D in FY2022. Therefore, if we were like the average of similar institutions, we should have reported approximately $14 million of institutional R&D expenditures.

- By contrast, we reported only $0.7 million, which was 20 time smaller than the predicted number.

Better Capturing of Institutional R&D Support (2)

- We improved our capturing of institutional R&D expenditures in FY2023.
- In this year, we reported $39 million of external R&D expenditures.
- Using the previous stated formula, and assuming that we were like the "average" university, it was reasonable for us to report (0.45 x 39) + 1 = 18.5 million of institutional expenditures, which would have brought our total to approximately $57.5 million.
- But we reported only $5.5 million of institutional R&D, bringing the total to $44.5 million. This is an improvement, but it is not adequate.

Better Capturing of Institutional R&D Support (3)

- Items that can be included in institutional R&D expenditures are:
  - State funding for research centers (e.g., CAP or NCEED)
  - University-funded seed grants
  - University-funded start-up funds for faculty
  - University-funded release time for research
  - Cost share
  - Unrecovered F&A
  - Tuition waiver for graduate research assistants

- These items should be:
  - Clearly for research purposes.
  - Separately accounted for, so that they can be auditable.

Summary

Summary (1)

- We use multiple metrics, the most salient of which are:
  - Grant applications (submissions)
  - Grant awards
  - Grant-funded expenditures
  - R&D expenditures (grant-funded R&D + institutionally-funded R&D)
- There is a difference between these terms. There is also a lag time between when awards come in and when expenditures happen. When discussing “grant numbers”, it is important to request and report the right ones.
- Our data show a major increase for all of these metrics over the past 15 years, but the real jump started beginning FY2021.
- Our success rate is:
  - > 50% for numbers
  - > 33% for dollar amounts

Summary (2)

- The overall percentage of R&D is growing. Hence the effective F&A rate is growing. However, our effective F&A still remains below 20%.
- At the current rate of submissions, and with a few large grants per year, it is entirely plausible to have over $90 million of new awards per year.
- Barring unexpected events, we should easily surpass an R&D expenditures of $50 million, one of the two criteria needed to achieve R1 status.
- All levels and units of the university need to work closely together to:
  - 1. Enhance the sponsored awards;
  - 2. Make sure they are spent in a timely manner; and
  - 3. Operations and expenditures are compliant with the university, state, and federal rules.

Questions / Comments?