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VOLUME I

**Improving the SBA's Methodology for Setting Small
Business Size Thresholds**

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Preface & Acknowledgements

Welcome to our Ninth Annual Acquisition Research Symposium! This event is the highlight of the year for the Acquisition Research Program (ARP) here at the Naval Postgraduate School (NPS) because it showcases the findings of recently completed research projects—and that research activity has been prolific! Since the ARP's founding in 2003, over 800 original research reports have been added to the acquisition body of knowledge. We continue to add to that library, located online at www.acquisitionresearch.net, at a rate of roughly 140 reports per year. This activity has engaged researchers at over 60 universities and other institutions, greatly enhancing the diversity of thought brought to bear on the business activities of the DoD.

We generate this level of activity in three ways. First, we solicit research topics from academia and other institutions through an annual Broad Agency Announcement, sponsored by the USD(AT&L). Second, we issue an annual internal call for proposals to seek NPS faculty research supporting the interests of our program sponsors. Finally, we serve as a “broker” to market specific research topics identified by our sponsors to NPS graduate students. This three-pronged approach provides for a rich and broad diversity of scholarly rigor mixed with a good blend of practitioner experience in the field of acquisition. We are grateful to those of you who have contributed to our research program in the past and hope this symposium will spark even more participation.

We encourage you to be active participants at the symposium. Indeed, active participation has been the hallmark of previous symposia. We purposely limit attendance to 350 people to encourage just that. In addition, this forum is unique in its effort to bring scholars and practitioners together around acquisition research that is both relevant in application and rigorous in method. Seldom will you get the opportunity to interact with so many top DoD acquisition officials and acquisition researchers. We encourage dialogue both in the formal panel sessions and in the many opportunities we make available at meals, breaks, and the day-ending socials. Many of our researchers use these occasions to establish new teaming arrangements for future research work. In the words of one senior government official, “I would not miss this symposium for the world as it is the best forum I've found for catching up on acquisition issues and learning from the great presenters.”

We expect affordability to be a major focus at this year's event. It is a central tenet of the DoD's Better Buying Power initiatives, and budget projections indicate it will continue to be important as the nation works its way out of the recession. This suggests that research with a focus on affordability will be of great interest to the DoD leadership in the year to come. Whether you're a practitioner or scholar, we invite you to participate in that research.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the ARP:

- Office of the Under Secretary of Defense (Acquisition, Technology, & Logistics)
- Director, Acquisition Career Management, ASN (RD&A)
- Program Executive Officer, SHIPS
- Commander, Naval Sea Systems Command
- Program Executive Officer, Integrated Warfare Systems
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- Office of the Assistant Secretary of the Air Force (Acquisition)



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- Director, Office of Acquisition Resources and Analysis (ARA)
- Deputy Assistant Secretary of the Navy, Acquisition & Procurement
- Director of Open Architecture, DASN (RDT&E)
- Program Executive Officer, Littoral Combat Ships

We also thank the Naval Postgraduate School Foundation and acknowledge its generous contributions in support of this symposium.

James B. Greene Jr.
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD
Associate Professor



Panel 5. Enablers for Growing Small Business Opportunities Within the DoD

Wednesday, May 16, 2012	
11:15 a.m. – 12:45 p.m.	<p>Chair: RADM Seán F. Crean, USN, Director, Office of Small Business Programs, Department of the Navy</p> <p><i>Too Big Not to Bundle? Examining Drivers for Consolidation of Navy Contracts</i> Max Kidalov, <i>Naval Postgraduate School</i></p> <p><i>Improving the SBA’s Methodology for Setting Small Business Size Thresholds</i> Nancy Young Moore, Amy G. Cox, Lloyd Dixon, Clifford A. Grammich, and Judith Mele, <i>RAND Corporation</i></p> <p><i>Small Business Research in a World of Skewed Returns</i> Toby Edison, <i>Defense Acquisition University</i></p>

Seán F. Crean—Mr. Crean is the director of the Office of Small Business Programs for the Department of the Navy. He serves as chief advisor to the Secretary on all small business matters. He is responsible for small business acquisition policy and strategic initiatives.

Mr. Crean joined the Secretary of the Navy Staff as a member of the Senior Executive Service in January 2010 and has over 30 years of federal service. Prior to receiving this appointment, he served as Deputy Assistant Secretary of the Navy for Acquisition and Logistics Management during a two-year military recall to active duty as a rear admiral in support of Operation Iraqi Freedom.

Mr. Crean’s previous experience includes serving as the senior procurement analyst for the U.S. Small Business Administration’s Office of Government Contracting Area I (New England) for 19 years. In this role he was the principal advisor to the SBA’s six regional district offices and congressional delegations on procurement issues. He provided acquisition strategy analysis for over 20 buying activities throughout the region, supporting both DoD and civilian federal agencies. He first entered federal civilian service as the deputy supply officer for Naval Air Station Brunswick, ME, where he was also appointed the activity small business specialist.

Mr. Crean’s combined military and civil service careers have provided complimentary and extensive leadership responsibilities in service to the country. As a member of the reserve component, he has attained the grade of rear admiral (two-star) and is currently assigned as deputy commander, Naval Supply Systems Command. He holds a Bachelor of Science degree in business management and marine transportation from State University of New York Maritime College and a Master of Business Administration degree from New Hampshire College’s Graduate School of Business.

He has a number of personal and command decorations, including two Legion of Merit awards. He is a member of the Defense Acquisition Corps and is DAWIA Level III Contracting certified.



Improving the Methodology for Setting Small Business Size Thresholds¹

Nancy Young Moore—Moore is a senior management scientist at RAND where she has worked since 1976. Her research spans sourcing, supply chain management, and small business policy issues. She focuses on applying and adapting innovative commercial business practices in process improvement, outsourcing, purchasing, and change management to DoD supply chain and facilities management. Moore earned a PhD in water resources systems engineering from UCLA where she also earned a BS (summa cum laude) and an MS in engineering. She is a registered civil engineer with the state of California. [nancy@rand.org]

Amy G. Cox—Cox (PhD, sociology, University of Maryland) is a social scientist at RAND whose research addresses organizational change, supply chain management and small business policy, labor market inequalities, and public assistance programs. Her recent research examines the role that personnel play in implementing institutional change and investigates the potential barriers faced by small businesses in the marketplace and by women and racial-ethnic minorities in the workplace. Cox's earlier research analyzed whether gender affects the allocation of federal research funding and the impact of welfare reform on public assistance use and private health insurance rates. [cox@rand.org]

Lloyd Dixon—Dixon is a senior economist at RAND specializing in microeconomics and empirical research. He has examined the economic impacts of a number of types of existing and proposed projects and has studied regional and local economic issues and policies. Dr. Dixon holds a BS in engineering and a BA in political science from Stanford University, and a PhD in economics from the University of California at Berkeley. [dixon@rand.org]

Clifford A. Grammich—Grammich has been a communications analyst at RAND since 1999. His work for RAND has included national security, demographic, criminal justice, and education issues, among others. He has also worked for community research organizations and as a journalist. He holds bachelor's, master's, and doctoral degrees from the University of Chicago in political science. [grammich@rand.org]

Judith Mele—Mele is a research programmer at RAND where she analyzes large-scale, complex databases in support of various projects. Her work spans federal and Department of Defense contract action and contractor data, as well as manpower and personnel data. She holds a bachelor's degree in sociology from Pennsylvania State University. [judym@rand.org]

Abstract

The Small Business Administration (SBA) recently developed a new method for determining whether a business is small or other-than-small for procurement purposes. The resulting firm-size thresholds determine whether a business is eligible for federal procurement preferences, as well as whether the Department of Defense meets its statutory goals for direct contract dollars with small businesses. The definition of what goods and services represent an industry, as well as what metric the SBA should use to measure firm size, affects the outcome of the method, as does the data that are used for it. If the industry definition is too broad or narrow, if the metric is inappropriate for the industry, or if the data is flawed because of how it is collected, the size threshold will be inappropriate. A method that more directly assesses industry characteristics, as well as reassesses the industry definition and metric used to measure firm size, would help improve the quality of the size-thresholds determination process.

¹ This paper summarizes work that was done for the DoD Office of Small Business Programs within RAND's National Defense Research Institute Federally Funded Research and Development Center.



Introduction

The federal government has long sought to boost small businesses by purchasing goods and services from them. Currently, there is a government-wide goal that the federal government spend 23% of its dollars for goods and services directly with small businesses. This goal reflects federal policy that a “fair proportion” of all federal purchases should be made with small businesses.

Such a goal raises the question of what a “small” business is. For procurement preferences and other programs such as loan assistance, the Small Business Administration (SBA) sets size thresholds by industry. Today, these thresholds are typically 500 employees for manufacturing industries and \$7 million in annual receipts for services firms.

The Department of Defense (DoD) accounts for about two thirds of all federal purchases and hence is key to meeting the government-wide goal for purchases from small businesses. The pattern of DoD purchases by industry can make this difficult.

For example, the DoD spends more money on aircraft manufacturing than in any other industry, as Table 1 shows. Only about 2% of its dollars in this industry are with small businesses. This roughly approximates the share that small firms have of the industry but makes it difficult for the DoD to have 23% of all its purchases be with small businesses.

Table 1. DoD Success in Meeting 23% Goal Varies by Industry

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DoD Success in Meeting 23 Percent Goal Varies by Industry – Selected Examples

<i>Industry</i>	<i>Small business percent</i>	
	<i>2002 Economic Census</i>	<i>DoD 2002 utilization</i>
Aircraft Manufacturing (336411)	2.6%	1.8%
Guided Missile and Space Vehicle Manufacturing (336414)	2.3	1.9
Military Armored Vehicle, Tank, and Tank Component Manufacturing (336992)	15.1	3.1
Computer Systems Design Services (541512)	28.1	26.8
Other Computer Related Services (541519)	45.1	25.4
Facilities Support Services (561210)	15.6	34.2

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Source: 2002 Economic Census, Fiscal year 2002 OUSD data

In five of the top ten industries in which the DoD spends money, small businesses account for less than 16% of all industry activity. Complicating what may be a small business within a given industry is the extraordinary variety of goods and services that may be sold within it. For example, aircraft manufacturing includes manufacturing of aircraft, autogiros, blimps, gliders, helicopters, and ultra-light aircraft, goods of varying interest to the DoD and amenability to small-business production.



These issues led the DoD Office of Small Business Programs to ask the RAND Corporation to review issues regarding size standards. This paper briefly summarizes the establishment and evolution of size standards, how large and small businesses view threshold issues, and what improvements might be made to the process for setting standards.

Establishment and Evolution of Standards: Arbitrary Origins and Failure to Keep Pace With Industry Changes?

Efforts to define small businesses date at least to the 1930s, when the Reconstruction Finance Corporation needed to set a threshold for determining eligibility for loans to small businesses. Efforts to determine them for military procurement purposes date at least to World War II, when the Smaller War Plants Corporation set a threshold of 500 employees for determining what constitutes a small business. This threshold was considered “arbitrary” by two historians but persisted through the enactment of the Small Business Act in 1953.

The Small Business Act in 1953 gave to the SBA discretion to set size thresholds. Thresholds for most industries are set to what the SBA calls “anchor” standards: 500 employees for manufacturing firms and currently \$7 million in average annual receipts for services firms. Other legislation has used other, typically far smaller, thresholds to define small businesses for non-procurement purposes, as Table 2 illustrates.

Table 2. Congress Has Used Many Different Size Thresholds for Applicability of Legislation

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Congress Has Used Many Different Size Thresholds for Applicability of Legislation

Act	Year	Threshold
Civil Rights	1964	15 employees
Age Discrimination in Employment	1967	20 employees
Occupational Safety and Health	1970	11 employees
COBRA (on group health plans)	1986	20 employees
Worker Adjustment and Retraining	1988	100 employees
Americans with Disabilities	1990	15 employees
Clean Air Amendments	1990	100 employees
Family and Medical Leave	1993	50 employees
FDA Modernization	1997	\$500K in sales

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The SBA has adjusted thresholds over time, but often not as fast as economic conditions have changed. Although more manufacturing is now concentrated among firms of at least 500 employees, the SBA has not changed the anchor threshold of 500 employees. It has adjusted the anchor receipts threshold for services firms over time, but not at the pace of inflation indices, as shown in Figure 1.



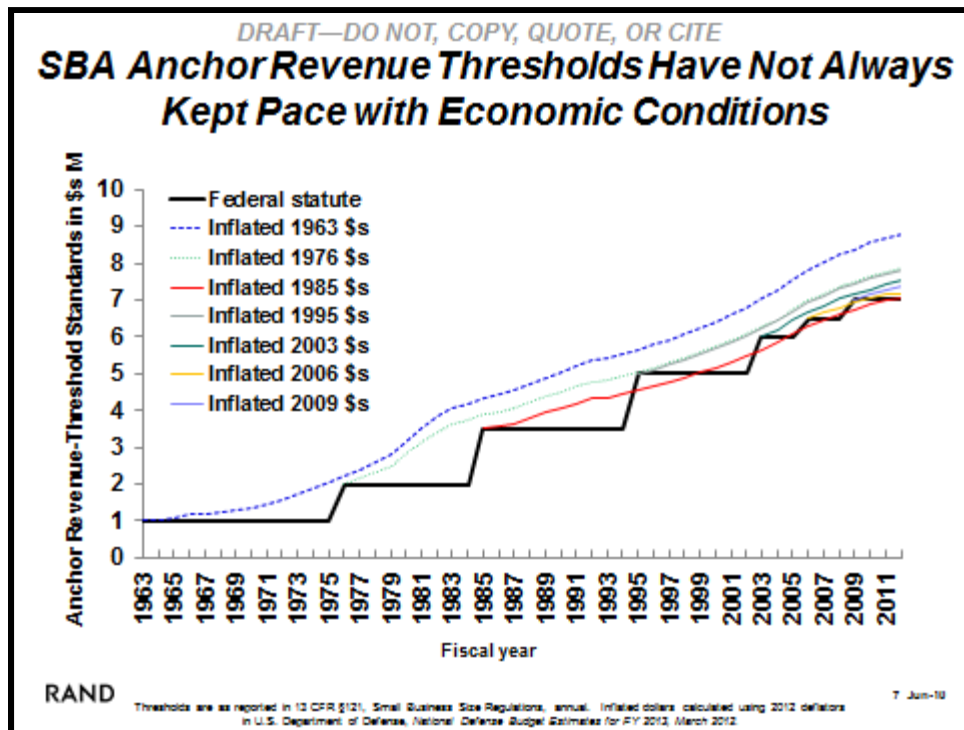


Figure 1. SBA Anchor Revenue Thresholds Have Not Always Kept Pace With Economic Conditions

Business Views of Size-Threshold Issues: Confusion Over Industry Definitions and Thresholds

Representatives of large and small businesses that we interviewed identified several problems with current size thresholds. Large-business representatives noted that high capital needs, costly production inputs, salaries for professional employees, and security requirements can all boost revenue requirements and push small businesses over the size threshold. Penalties for inadvertently and incorrectly identifying a business as small, these representatives told us, can sometimes lead them to avoid small subcontractors for certain federal government work. Emerging best practices for fewer, larger suppliers, with smaller suppliers pushed further up the supply chain, have also made it more difficult for large prime contractors to gain subcontracting credit for federal contract work.

The small-business representatives we interviewed also noted problems with costs that could boost total revenues but not profits. They contended that dichotomous size categories (i.e., small and other-than-small) for federal small-business programs do not adequately reflect the incremental growth that their businesses undergo. They reported confusion over inconsistent industry definitions and thresholds and contended fluctuations in federal business can make it difficult to forecast demand and growth.

Improving Methods for Determining What Constitutes a Small Business: Justify Anchor Standards, Define Industries, and Measure Better

Further complicating the establishment of small-business size thresholds are issues with the data used to set them. Table 3 contains different sources of data on the number of firms, establishments, employees, and receipts, showing differing sizes of industries.



Table 3. Differing Sources Can Have Widely Varying Data

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***Differing Sources Can Have Widely Varying Data—
Example: Ammunition Manufacturing (332993)***

	<i>Published Economic Census Data</i>	<i>Special Tabulations for SBA</i>	<i>Statistics of U.S. Businesses</i>	<i>FPDS</i>
Firms	n/a	49	46	102
Establishments	54	54	52	139
Employees	7,111	6,925	5,984	n/a
Receipts (\$s M)	1,128	1,190	875	1,887

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Further, federal procurement data in some industries, such as manufacturing of ammunition and armored vehicles, reports that the value of DoD purchases exceeds the size of the industry as the Census Bureau reported, as shown in Table 4. Better-quality data could help determine the size and shape of each industry and what constitutes small business within it.



Table 4. Data Used for Setting Thresholds May Also Fail to Reflect True Conditions in Defense Industries

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Data Used for Setting Thresholds May Also Fail to Reflect True Conditions in Defense Industries

Calendar/Fiscal Year 2002	Ammunition (except small arms) Manufacturing ¹	Military Armored Vehicle, Tank, and Tank Component Manufacturing ²
Reported industry dollars (\$sB) ³	\$1.19	\$1.51
DoD goaling dollars (\$s B) ⁴	\$1.89	\$1.94
Reported % small-business in industry ³	28.1%	10.5%
DoD % dollars to small-business in industry ⁴	12.2%	3.1%

¹ NAICS 332993
² NAICS 338992
³ 2002 Economic Census
⁴ FPD 8

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Source: 2002 Economic Census, Fiscal year 2002 D0350 data

Firm reporting of revenue by “primary” NAICS may also lead to distortions in the distribution of firms by size in an industry. The notional example in Table 5 illustrates how firm X with multiple establishments producing in one or more industries can report very different revenues per industry, depending on the level at which it reports and the distribution of revenue among NAICS.



Table 5. Fidelity of Firm Reporting Can Lead to Under and Over Estimates of Revenue for Each NAICS

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Fidelity of Firm Reporting Can Lead to Under and Over Estimates of Revenue for Each NAICS

Firm X			
Business units	NAICS revenue reporting by		
	NAICS	Establishment	Firm
Establishment A			
NAICS 1	500,000	1,000,000	
NAICS 2	300,000		
NAICS 3	200,000		
Total Revenue	1,000,000		
Establishment B			
NAICS 4	1,200,000	2,000,000	
NAICS 5	800,000		
Total Revenue	2,000,000		
Establishment C			
NAICS 6	5,000,000	5,000,000	8,000,000
Total Firm Revenue	8,000,000		

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Better justification of the anchor standards may also help. These are based on economic conditions and the state of technology at least 60 years ago and were established in part for want of a better definition. No analytic case has been made for them; such might provide insight into what should constitute a small business for procurement and other purposes.

Industries can also be very broad, even at the level of six-digit North American Industry Classification System code as illustrated in Figure 2. A given industry may encompass more activities than are of interest to the DoD. Conversely, DoD purchases in some industries can encompass a wide range of activities. More narrow industry definitions may be needed to capture more homogeneous activities.



An Industry Can Be Defined Very Broadly

- **A single industry can include very different types of goods or services**
 - **Aircraft Manufacturing (336411) includes aircraft, blimp, helicopter, ultra-light, and hang glider manufacturing**
 - **Engineering Services (541330) includes acoustical, boat, chemical, civil, construction, heating, mining, and traffic engineering services**
- **To increase competitiveness in some industries**
 - **One size standard may not be appropriate → exceptions**
 - **Industry may need to be more narrowly defined**

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Figure 2. An Industry Can Be Defined Very Broadly

Measures for some industries may also be inappropriate. For example, receipts may not be an appropriate measure for service industries with high capital requirements, high material costs, highly paid employees, or expensive certification requirements. The SBA also has an upper bound on size standards; higher size standards than this level may be needed to achieve the competitiveness goals of small-business policy.

The SBA recently revised its methodology for setting small business size thresholds, which is summarized in Figure 3. We identified a number of shortcomings with the methodology. First, there is no justification for the anchor standards with which it starts to compare industries. The groups of industries it compares to one another may be inappropriate because of basic structural differences. As mentioned earlier, industries can be very broad. The size metric the SBA uses may no longer be appropriate for the industry. The SBA sets an arbitrary upper bound on its size standards. Lastly, the comparison metrics that it does use are not all supported by analysis.



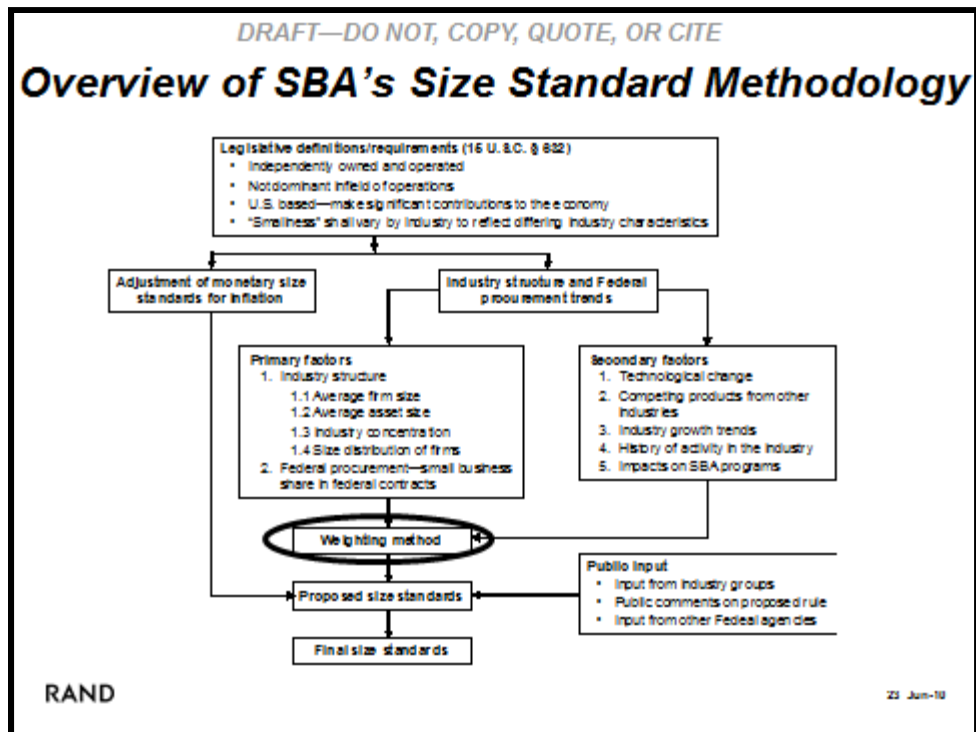


Figure 3. Overview of SBA's Size Standard Methodology

An ideal approach to estimating size thresholds would directly assess the following five industry characteristics.

First, the method should identify the minimum firm size needed to remain competitive in an industry. Average costs of production typically fall as production increases. These can vary by industry. Small-business size thresholds might be based in part on the size required to be an ongoing concern in a given industry.

Second, a method for determining what a small business is should identify the size below which access to credit becomes more limited. Access to credit is critical to operations of a firm. Future thresholds might consider credit terms available to firms of different sizes in an industry.

Third, the method should identify the minimum size needed to administer a federal prime contract for the types of goods and services purchased by the military from the industry. To successfully compete for federal contracts, a business must be of sufficient size to administer them. Accordingly, a method for setting small-business size by industry should consider the resources and number of personnel needed to administer the types of contracts typically issued by the federal government in a particular industry.

Fourth, it should evaluate criteria based on the competitiveness of the industry. The Herfindahl-Hirschman Index (HHI) may be more appropriate for this than the Gini coefficient the SBA currently uses. The Federal Trade Commission uses the HHI, a ratio showing concentration of industry revenues, in determining whether to approve mergers or acquisitions.

Finally, different weights of these criteria may be appropriate for differing purposes. The size standards derived from each of the above criteria will likely differ, leaving policymakers to determine which is most relevant in a given industry. To satisfy all,



policymakers can pick the maximum size threshold suggested by individual criteria in setting a threshold for defining small business.

We propose an alternative new methodology for setting size threshold, which is summarized in Figure 4. It addresses some of the data shortcomings discussed earlier, such as an inhomogeneous NAICS and inappropriate size measure, as well as shortcomings in the current SBA methodology and attempts to directly assess the above five industry characteristics.

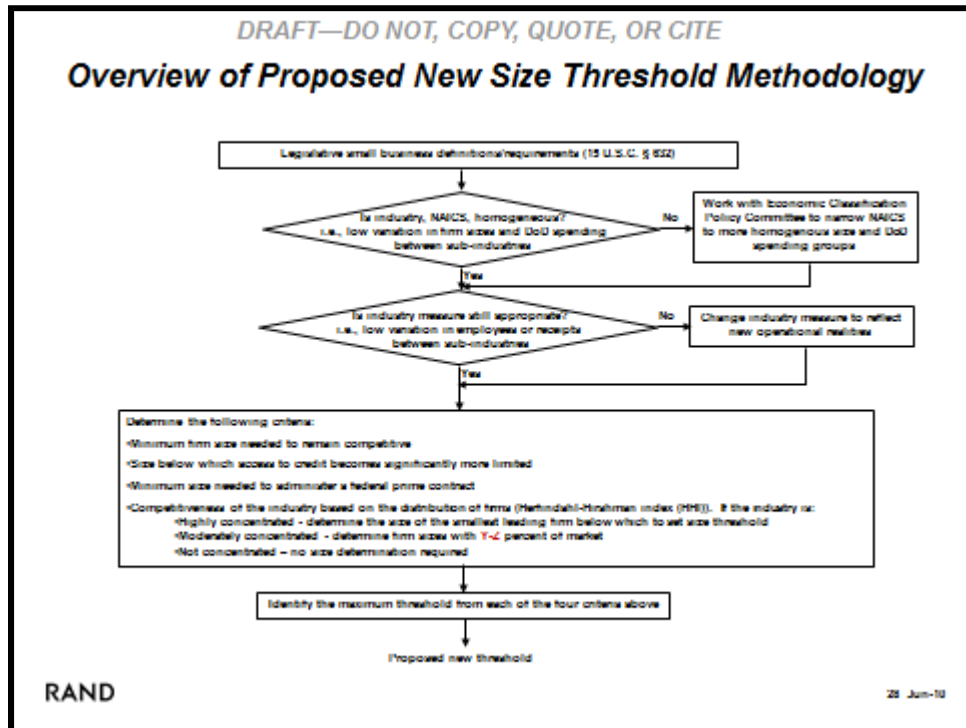


Figure 4. Overview of Proposed New Size Threshold Methodology

In summary, we found that the economic census and FPDS data supporting SBA threshold analyses are flawed. Current threshold metrics used for specific industries may no longer be appropriate, and some industry classifications may be too broad. The current SBA methodology for setting thresholds has a number of weaknesses. Lastly, the SBA has no methodology for targeting industries for threshold review.

We recommend that the SBA work to improve the quality of economic census and FPDS data, and that before changing thresholds, the SBA should analyze an industry's metric to see if it is still appropriate, as well as the industry's classification to see if it is too broad or too narrow. The SBA's methodology should acknowledge the unique and changing aspects of industries that are likely to decouple it from its past thresholds, as well as those of other industries. Lastly, the SBA should develop and refine a methodology for targeting industries for metric, classification, and threshold review, such as focusing on industries with threshold exceptions, which suggest that the metric or classification may need changing, and survey large and small businesses to identify any industries where they are encountering problems with current thresholds.



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