MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
January 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: January 31st, 2018

Preliminary Version (does not include ISM National Results for January 2018)
*****EMBARGOED until 9 a.m. Eastern*****

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Beth Krey**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	January 2018	December 2017	November 2017
Seasonally adjusted	63.40	65.57	59.62

(Milwaukee, Wisconsin) – January's Index registered at 63.40, an increase from 65.57 in December. January's Index indicates positive territory.

What respondents are saying in January 2018:

- Upward trends in short term demand
- Increased volatility in demand
- Electronic component allocation and extended lead times has a direct impact on our business. I see this as a long term issue for our organization.
- Transportation capacity is tight – finding dry trucks is hard – reefers are worse

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

What respondents are saying in December 2017:

- Transportation issues lengthen lead times
- Both zinc and resin are increasing

MANUFACTURING AT A GLANCE: January 2018*				
Index	Series Index Jan-18	Series Index Dec-17	Percentage Point Change	Direction
PMI	63.40	65.57	-2.2	growing
New Orders	60.34	88.33	-28.0	growing
Production	68.86	72.65	-3.8	growing
Employment	61.48	58.67	2.8	growing
Supplier Deliveries	76.32	65.33	11.0	slower
Inventories	50.00	42.86	7.1	neutral
Customers' Inventories *	33.33	32.14	1.2	declining
Prices *	87.50	82.14	5.4	growing
Backlog of Orders *	50.00	73.08	-23.1	neutral
Exports *	53.33	62.50	-9.2	growing
Imports *	65.38	68.75	-3.4	growing

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **November 2017, December 2017, and January 2018.**

	Diffusion Index Nov-17	Diffusion Index Dec-17	Diffusion Index Jan-18	Direction	Comments
Blue Collar	58.3	58.7	62.0	growing	-
White Collar	58.3	51.3	58.9	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in January 2017:

- Labor shortages continue into the new year
- Challenges in finding talent

Buying Policy

Average commitment lead-time for Capital Expenditures increased from 99 days to 130 days. Average lead-time for Production Materials decreased from 52 days to 45 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies decreased from 23 days to 21 days.

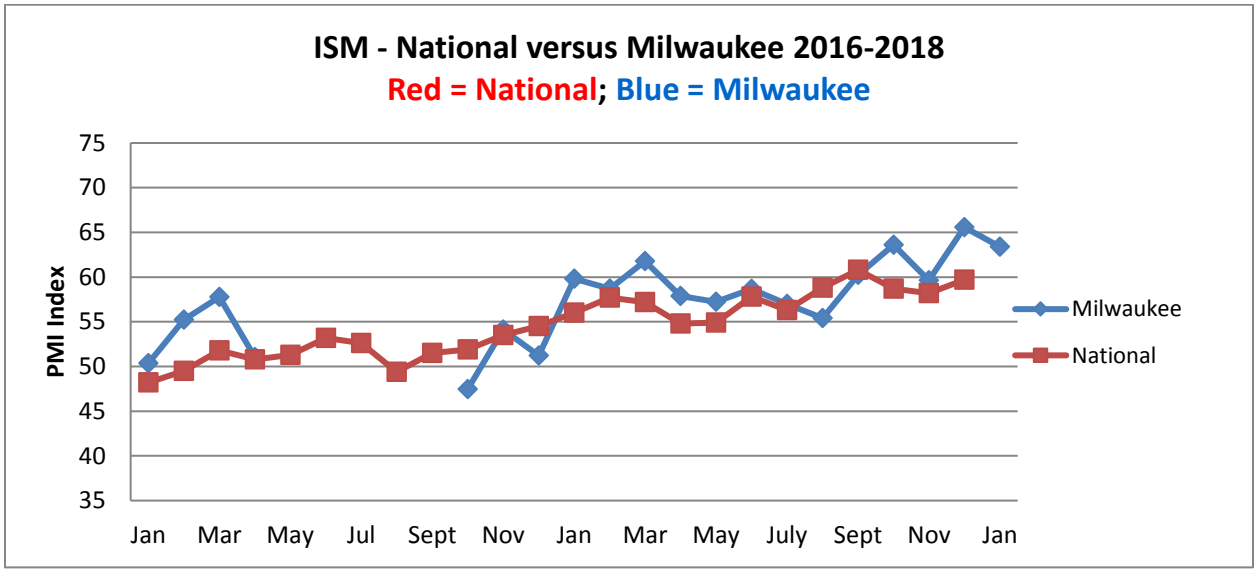
Six- Month Outlook on Business Conditions

In this outlook, there is an upward shift in positive expectations compared with November in terms of market conditions. Approximately 50% of respondents expect positive conditions, 42.86% expect conditions to remain the same and 7.14% of the respondents expect conditions to worsen within the next six months.

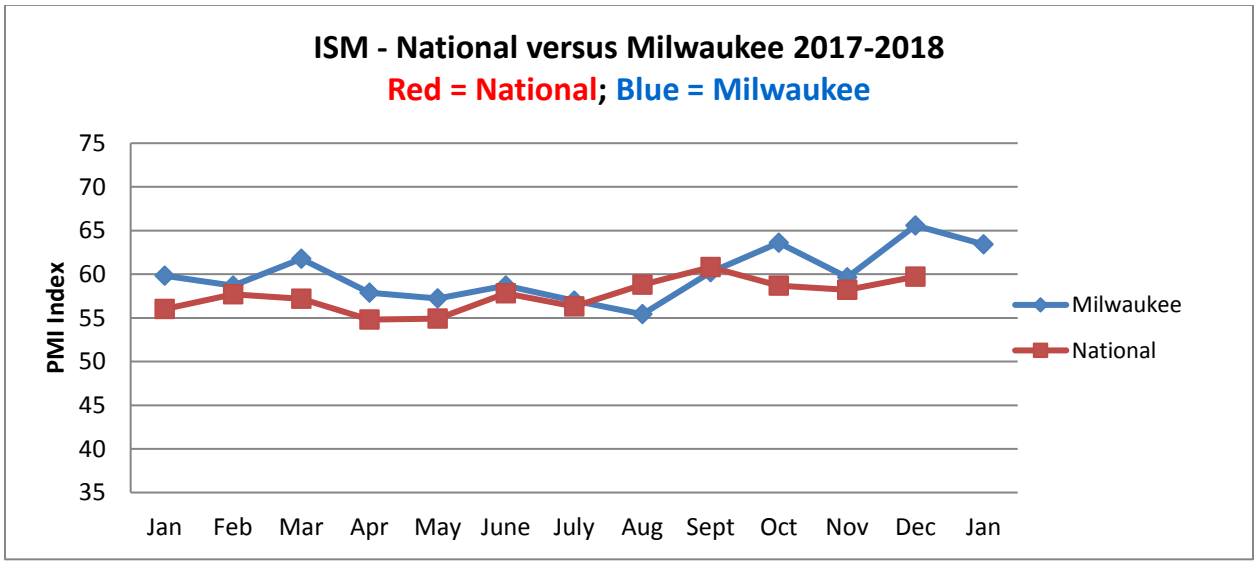
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Jan-18	**65.00%**	**20.00%**	**15.00%**	**75.00%**
Dec-17	**50.00%**	**42.86%**	**7.14%**	**71.43%**
Nov-17	**46.67%**	**53.33%**	**0.00%**	**73.33%**

Milwaukee versus the Nation –

Jan 2016 – Jan 2018 Graph



2017-2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
February 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: February 27th, 2018

Preliminary Version (does not include ISM National Results for February 2018)
*****EMBARGOED until 9 a.m. Eastern*****

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	February 2018	January 2018	December 2017
Seasonally adjusted	75.24	63.40	65.57

(Milwaukee, Wisconsin) – February's Index registered at 75.24, an increase from 63.40 in January. February's Index indicates positive territory.

What respondents are saying in February 2018:

- 232 Action Recommendations will cause long-term steel and aluminum prices to rise
- Inconsistent customer demand is creating uncertainty in the market
- Manufacturers are preparing for spring sales
- Shortages in trucks and general transportation services have been an issue
- Electronic components are experiencing shortages and lead time extensions

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

MANUFACTURING AT A GLANCE: February 2017*				
Index	Series Index Feb-18	Series Index Jan-18	Percentage Point Change	Direction
PMI	75.24	63.40	11.8	growing
New Orders	64.85	60.34	4.5	growing
Production	82.10	68.86	13.2	growing
Employment	77.21	61.48	15.7	growing
Supplier Deliveries	85.37	76.32	9.1	slower
Inventories	66.67	50.00	16.7	growing
Customers' Inventories *	36.36	33.33	3.0	declining
Prices *	86.67	87.50	-0.8	growing
Backlog of Orders *	61.54	50.00	11.5	growing
Exports *	65.00	53.33	11.7	growing
Imports *	66.67	65.38	1.3	growing

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **December 2017, January 2018, and February 2018.**

	Diffusion Index Dec-17	Diffusion Index Jan-18	Diffusion Index Feb-18	Direction	Comments
Blue Collar	58.7	62.0	57.5	growing	-
White Collar	51.3	58.9	50.4	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in February 2017:

- Transportation sector is experiencing labor shortages
- Facing challenges in hiring general laborers

Buying Policy

Average commitment lead-time for Capital Expenditures decreased from 130 days to 114 days. Average lead-time for Production Materials increased from 45 days to 46 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies remained constant at 21 days.

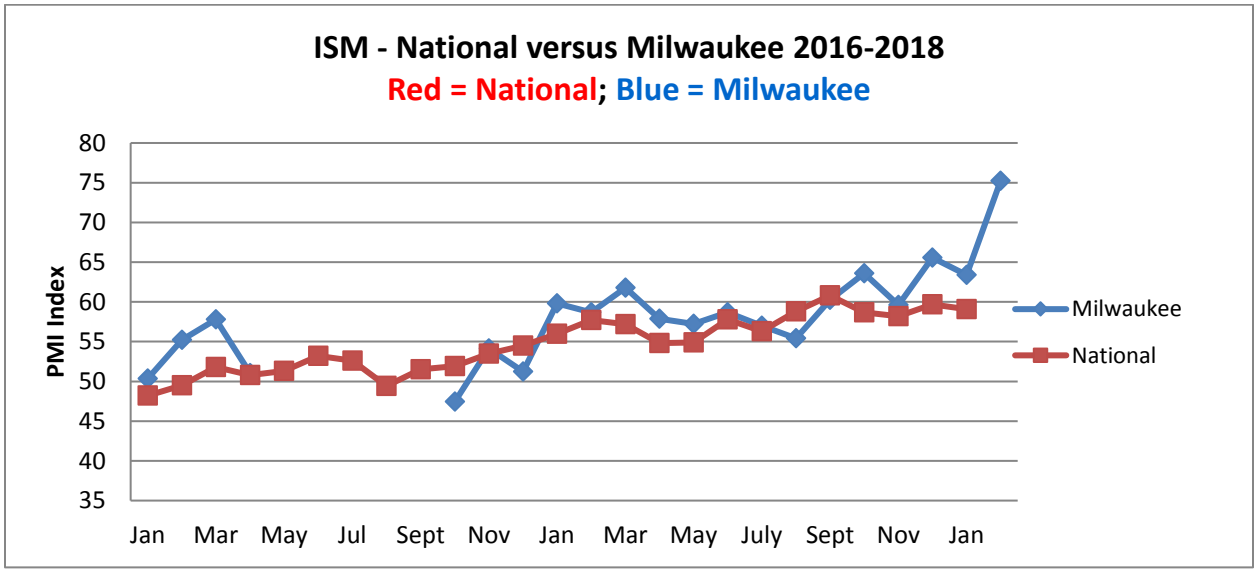
Six- Month Outlook on Business Conditions

In this outlook, there is an upward shift in positive expectations compared with January in terms of market conditions. Approximately 73% of respondents expect positive conditions, 13% expect conditions to remain the same and 13% of the respondents expect conditions to worsen within the next six months.

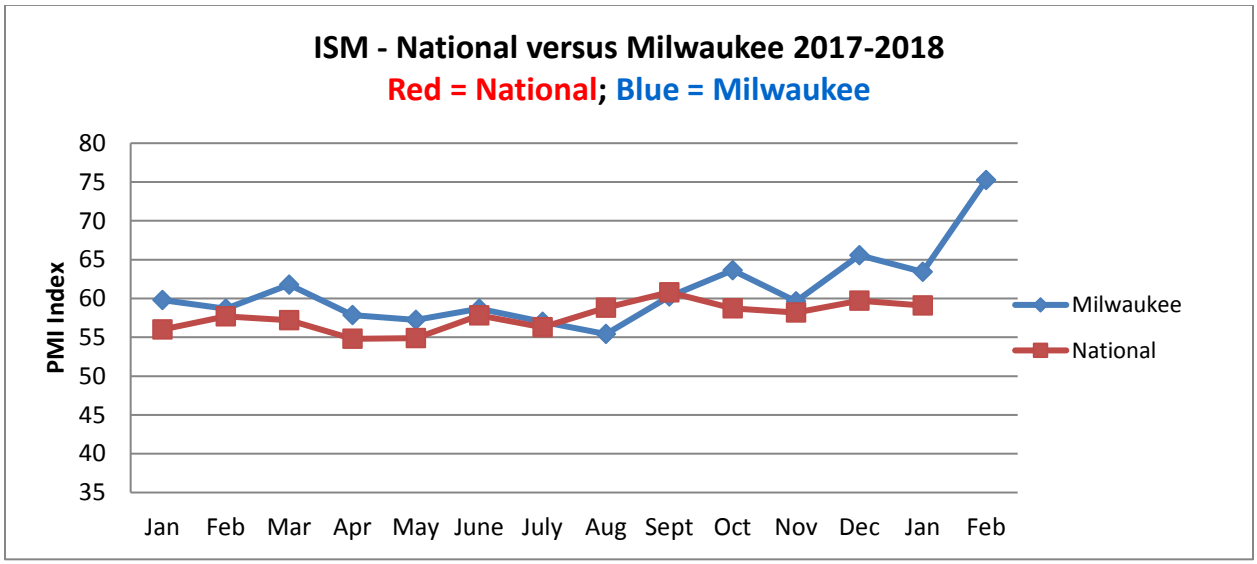
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Feb-18	**73.33%**	**13.33%**	**13.33%**	**80.00%**
Jan-18	**65.00%**	**20.00%**	**15.00%**	**75.00%**
Dec-17	**50.00%**	**42.86%**	**7.14%**	**71.43%**

Milwaukee versus the Nation –

Jan 2016 – Feb 2018 Graph



2017-2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
March 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: March 30th, 2018

Preliminary Version (does not include ISM National Results for March 2018)
*****EMBARGOED until 9 a.m. Eastern*****

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	March 2018	February 2018	January 2018
Seasonally adjusted	67.80	75.24	63.40

(Milwaukee, Wisconsin) – March's Index registered at 67.8, a decrease from 75.24 in February. March's Index still indicates very positive territory.

What respondents are saying in March 2018:

- Steel & Aluminum tariffs pose significant risk as we will be at a competitive disadvantage to our competition based in Europe. They import finished goods and will not have tariffs, we import specialized raw materials that is not produced in the U.S. so that we can manufacture finished goods in the U.S. This will hurt us because we manufacture in the U.S. and they don't.

- Two issues are facing our supply chain department - increasing prices and increasing lead times. Both seems as though they are long term issues.
- Signs of slowing from some customers, particularly domestic US.
- Quoted jobs are coming to fruition.
- Tariffs will slow domestic production in favor of imported equipment
- Currency markets and government policies are creating uncertainty
- Received notification from steel plate supplier of 40% increase on future orders due to tariff announcement.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

MANUFACTURING AT A GLANCE: March 2018*				
Index	Series Index Mar-18	Series Index Feb-18	Percentage Point Change	Direction
PMI	67.80	75.24	-7.4	growing
New Orders	64.88	64.85	0.0	growing
Production	64.55	82.10	-17.6	growing
Employment	78.19	77.21	1.0	growing
Supplier Deliveries	81.38	85.37	-4.0	slower
Inventories	50.00	66.67	-16.7	neutral
Customers' Inventories *	30.00	36.36	-6.4	declining
Prices *	88.24	86.67	1.6	growing
Backlog of Orders *	73.33	61.54	11.8	growing
Exports *	63.64	65.00	-1.4	growing
Imports *	75.00	66.67	8.3	growing

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **January 2018, February 2018, and March 2018.**

	Diffusion Index Jan-18	Diffusion Index Feb-18	Diffusion Index March-18	Direction	Comments
Blue Collar	62.0	57.5	58.4	growing	-
White Collar	58.9	50.4	51.1	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in March 2018:

- Labor is very tight and hard to keep people once hired in production jobs.
- Many firms are looking to hire
- Tightening labor markets pose a risk
- Challenges in retaining production workers

Buying Policy

Average commitment lead-time for Capital Expenditures decreased from 114 days to 108 days. Average lead-time for Production Materials increased from 46 days to 52 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies decreased from 21 days to 19 days.

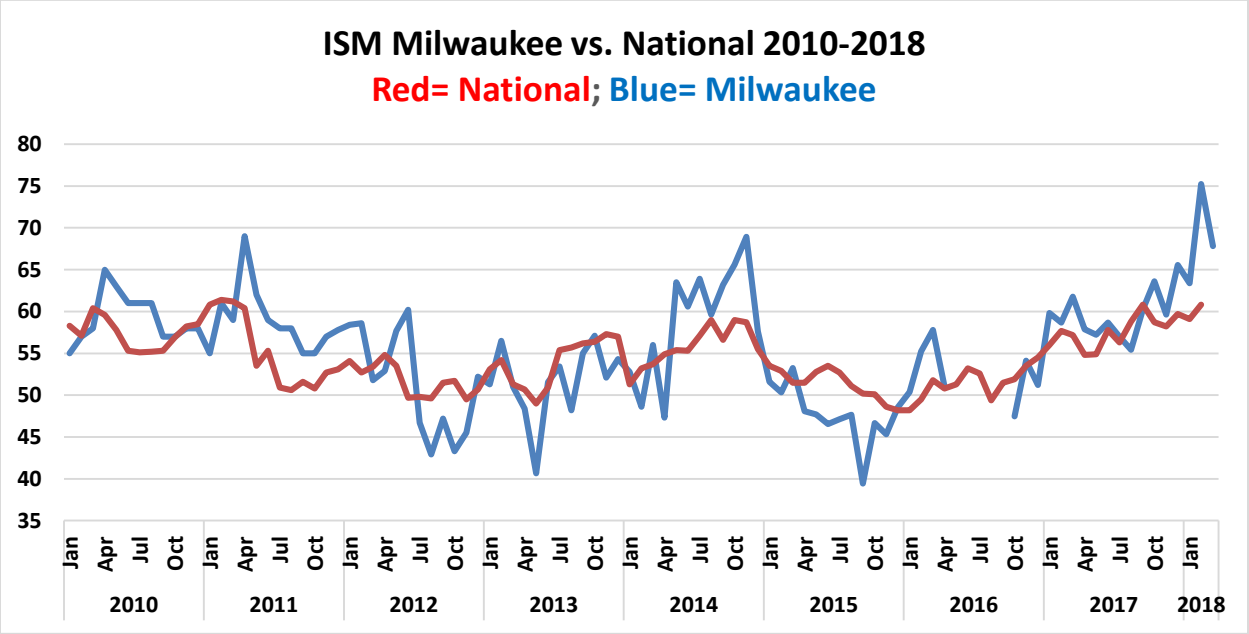
Six- Month Outlook on Business Conditions

In this outlook, there is an upward shift in positive expectations compared with January in terms of market conditions. Approximately 52.94% of respondents expect positive conditions, 35.29% expect conditions to remain the same and 11.76% of the respondents expect conditions to worsen within the next six months.

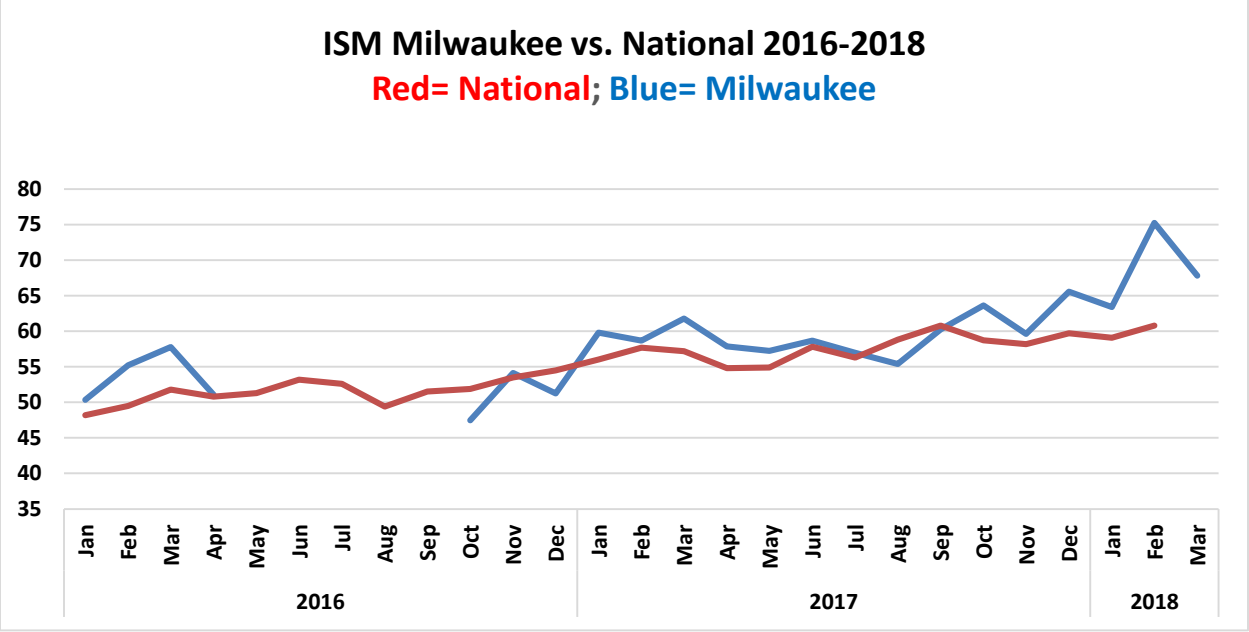
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Mar-18	52.94%	35.29%	11.76%	70.59%
Feb-18	73.33%	13.33%	13.33%	80.00%
Jan-18	65.00%	20.00%	15.00%	75.00%

Milwaukee versus the Nation –

January 2010 – March 2018 Graph



January 2016- March 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
April 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: April 30th, 2018

Preliminary Version (does not include ISM National Results for April 2018)
*****EMBARGOED until 9 a.m. Eastern*****

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	April 2018	March 2018	February 2018
Seasonally adjusted	58.26	67.80	75.24

(Milwaukee, Wisconsin) – April's Index registered at 58.26, a decrease from 67.80 in March. April's Index continues to indicate positive territory.

What respondents are saying in April 2018:

- Near term demand showing significant reductions.
- Low long run demand.
- Uncertainty growing in market due to impacts of policy, tariffs, and trade issues.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

What respondents are saying in April 2018:

- Tariff and currency issues.
- Price increases and low inventory (long lead times) continue to plague our supply chain.

MANUFACTURING AT A GLANCE: April 2017				
Index	Series Index Apr-18	Series Index Mar-18	Percentage Point Change	Direction
PMI	58.26	67.80	-9.5	growing
New Orders	45.54	64.88	-19.3	declining
Production	59.14	64.55	-5.4	growing
Employment	76.78	78.19	-1.4	growing
Supplier Deliveries	69.86	81.38	-11.5	slower
Inventories	40.00	50.00	-10.0	declining
Customers' Inventories *	33.33	30.00	3.3	declining
Prices *	95.00	88.24	6.8	growing
Backlog of Orders *	44.44	73.33	-28.9	declining
Exports *	50.00	63.64	-13.6	neutral
Imports *	66.67	75.00	-8.3	growing

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **February 2018, March 2018, and April 2018.**

	Diffusion Index Feb-18	Diffusion Index March-18	Diffusion Index April-18	Direction	Comments
Blue Collar	57.5	58.4	62.4	growing	-
White Collar	50.4	51.1	62.4	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in April 2018:

- The company's economic peak has passed.
- Many customers are delaying order deliveries.

Buying Policy

Average commitment lead-time for Capital Expenditures increased from 108 days to 111 days. Average lead-time for Production Materials increased from 52 days to 55 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies increased from 19 days to 23 days.

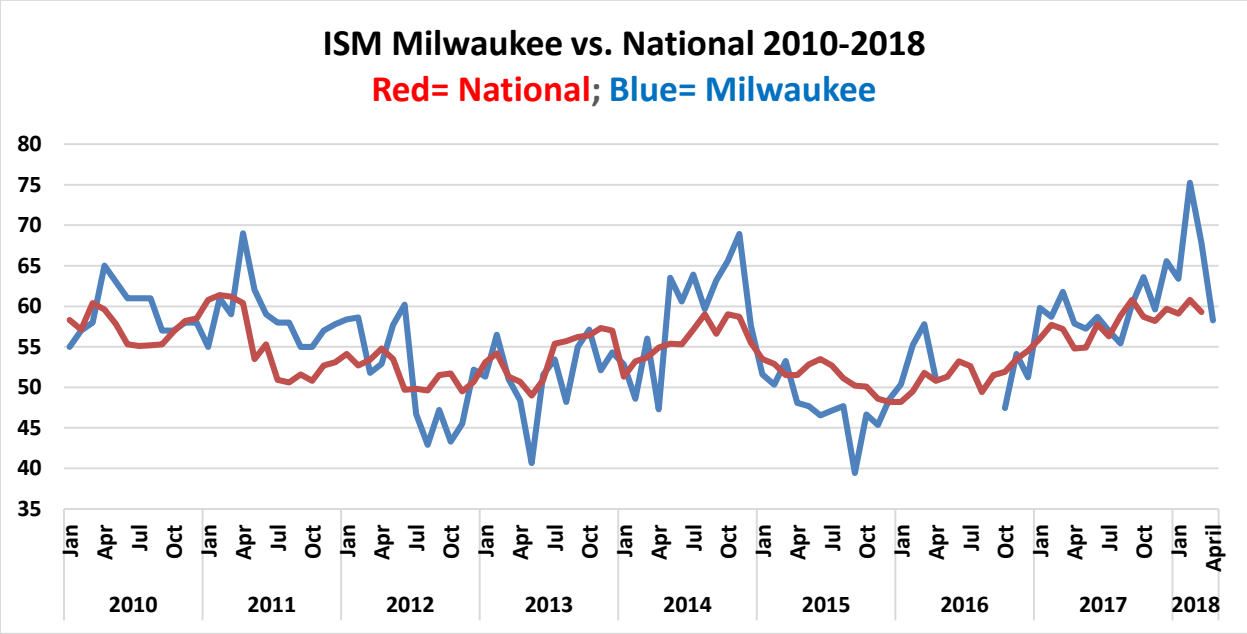
Six- Month Outlook on Business Conditions

In this outlook, there is a downward shift in positive expectations compared with March in terms of market conditions. Approximately 30% of respondents expect positive conditions, 40% expect conditions to remain the same and 30% of the respondents expect conditions to worsen within the next six months.

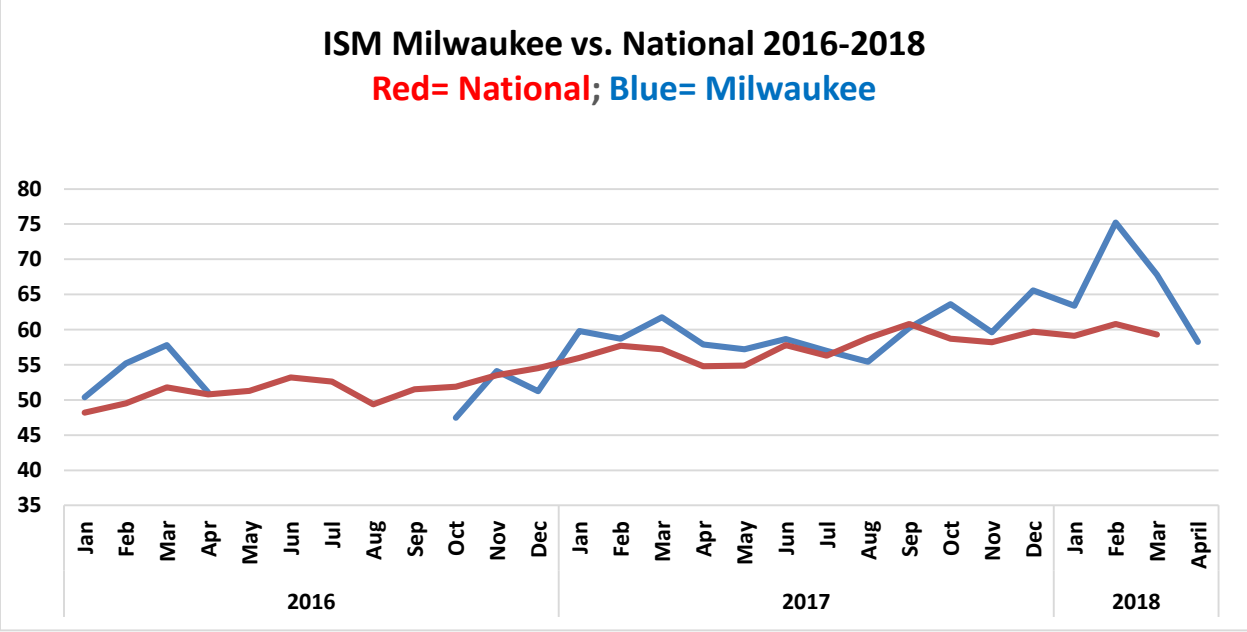
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Apr-18	**30.00%**	**40.00%**	**30.00%**	**50.00%**
Mar-18	**52.94%**	**35.29%**	**11.76%**	**70.59%**
Feb-18	**73.33%**	**13.33%**	**13.33%**	**80.00%**

Milwaukee versus the Nation –

January 2010 – April 2018 Graph



January 2016- April 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
May 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: May 31st, 2018

Preliminary Version (does not include ISM National Results for May 2018)
*****EMBARGOED until 9 a.m. Eastern*****

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	May 2018	April 2018	March 2018
Seasonally adjusted	67.90	58.26	67.80

(Milwaukee, Wisconsin) – May's Index registered at 67.90, an increase from 58.26 in April. May's Index continues to indicate positive territory.

What respondents are saying in May 2018:

- Demand has stabilized and suppliers are catching up, but forecast beyond 90 days is suspect
- Business is better than last year, but commodity prices, tariffs, and exchange rates are risks to our business this year
- Sales are strong. However, prices are soaring, lead times are sky rocketing, and quality is declining.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

What respondents are saying in May 2018:

- Electronic component constraints and extended lead times across many commodities is creating an excessive amount of noise within our organization
- Lead times are skyrocketing, especially among electronics
- Extended lead times and lack of availability of certain electronic components are the worst that I have seen in my 25 years in the electronics manufacturing industry. Namely multi-layer ceramic capacitors, NOR flash, DRAM and analog semiconductors.

MANUFACTURING AT A GLANCE: May 2018*				
Index	Series Index May-18	Series Index Apr-18	Percentage Point Change	Direction
PMI	67.90	58.26	9.6	growing
New Orders	67.90	45.54	22.4	growing
Production	71.06	59.14	11.9	growing
Employment	58.08	76.78	-18.7	growing
Supplier Deliveries	79.13	69.86	9.3	slower
Inventories	63.33	40.00	23.3	growing
Customers' Inventories *	41.67	33.33	8.3	declining
Prices *	90.00	95.00	-5.0	growing
Backlog of Orders *	66.67	44.44	22.2	growing
Exports *	54.55	50.00	4.5	growing
Imports *	65.00	66.67	-1.7	growing

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **March 2018, April 2018, and May 2018.**

	Diffusion Index March-18	Diffusion Index April-18	Diffusion Index May-18	Direction	Comments
Blue Collar	58.4	62.4	61.3	growing	-
White Collar	51.1	62.4	61.3	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in May 2018:

- Very tight labor market
- Challenges with trucking and deliveries
- This period of rapid growth and higher prices cannot continue

Buying Policy

Average commitment lead-time for Capital Expenditures increased from 111 days to 112 days. Average lead-time for Production Materials increased from 55 days to 67 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies increased from 23 days to 30 days.

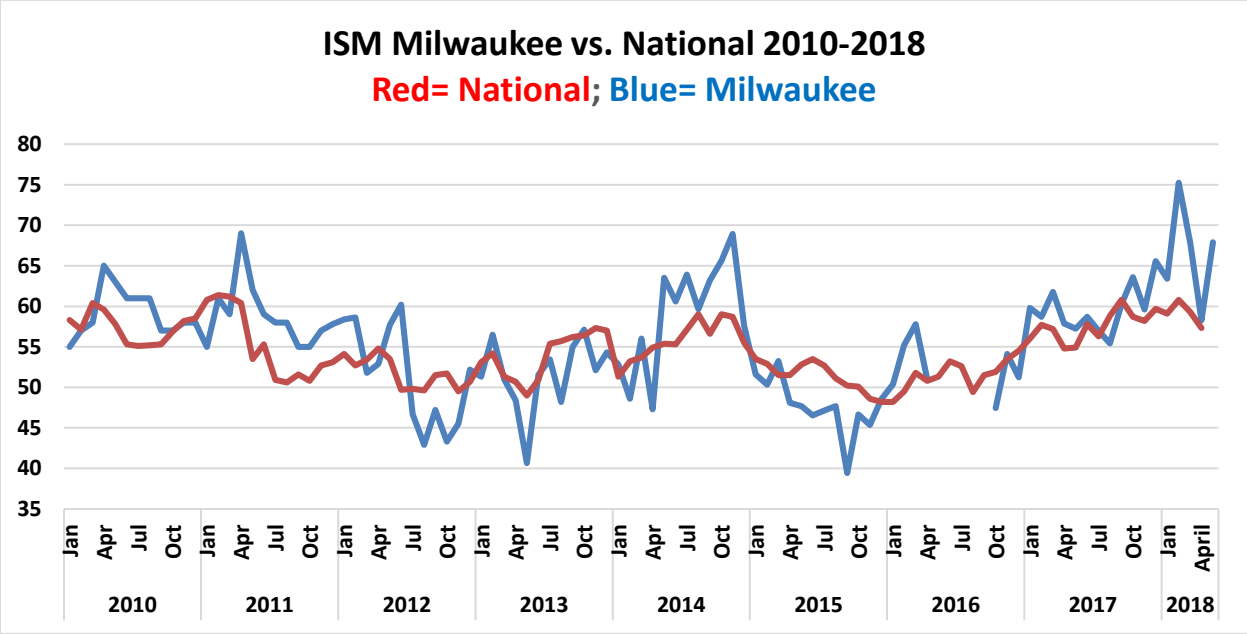
Six- Month Outlook on Business Conditions

In this outlook, there is a downward shift in positive expectations compared with April in terms of market conditions. Approximately 57% of respondents expect positive conditions, 35% expect conditions to remain the same and 7% of the respondents expect conditions to worsen within the next six months.

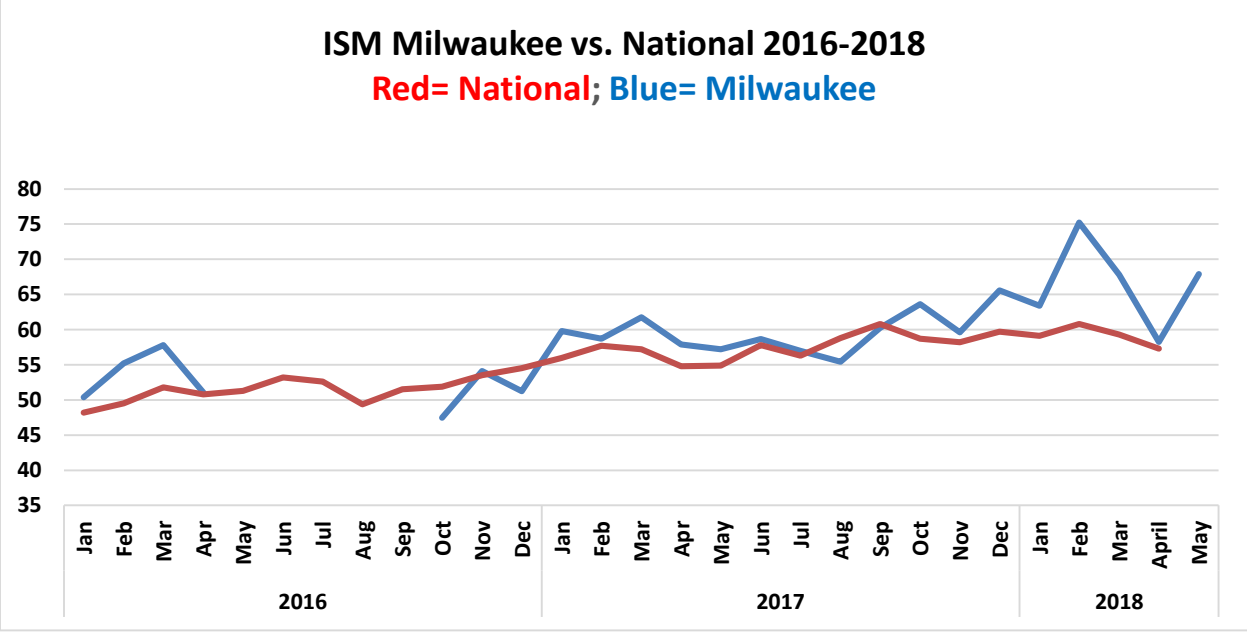
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
May-18	**57.14%**	**35.71%**	**7.14%**	**75.00%**
Apr-18	**30.00%**	**40.00%**	**30.00%**	**50.00%**
Mar-18	**52.94%**	**35.29%**	**11.76%**	**70.59%**

Milwaukee versus the Nation –

January 2010 – May 2018 Graph



January 2016- May 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
June 2018- Final Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: July 9th, 2018

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

My apologies for the absence of an "Early Release' version. We suffered technical problems, as well as a University shut-down during the holiday break. This 'Final Version' contains the ISM-National PMI.

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	June 2018	May 2018	April 2018
Seasonally adjusted	60.18	67.90	58.26

(Milwaukee, Wisconsin) – June's Index registered at 60.18, an increase from 67.9 in May. June's Index continues to indicate positive territory.

What respondents are saying in June 2018:

- Tariffs pose a strong risk to business conditions and company operations.
- Trade discussions are creating uncertainty and rising costs.
- Previous demand is falling as the price of raw materials rises.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

What respondents are saying in June 2018:

- Extending lead times and rising costs for electronic components
- Lead times are rising for raw steel and for foundries
- Overall uncertainty in the market

MANUFACTURING AT A GLANCE: June 2018*				
Index	Series Index Jun-18	Series Index May-18	Percentage Point Change	Direction
PMI	60.18	67.90	-7.7	growing
New Orders	61.25	67.90	-6.6	growing
Production	59.33	71.06	-11.7	growing
Employment	60.79	58.08	2.7	growing
Supplier Deliveries	77.86	79.13	-1.3	slower
Inventories	41.67	63.33	-21.7	declining
Customers' Inventories *	36.67	41.67	-5.0	declining
Prices *	88.89	90.00	-1.1	growing
Backlog of Orders *	62.50	66.67	-4.2	growing
Exports *	50.00	54.55	-4.5	neutral
Imports *	66.67	65.00	1.7	growing

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **April 2018, May 2018, and June 2018.**

	Diffusion Index April-18	Diffusion Index May-18	Diffusion Index June-18	Direction	Comments
Blue Collar	62.4	61.3	56.0	growing	-
White Collar	62.4	61.3	58.1	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in June 2018:

- Tight supply of trucks and drivers is an ongoing issue.
- Shortage of talented manpower.
- Rising costs due to skilled labor shortages.

Buying Policy

Average commitment lead-time for Capital Expenditures increased from 112 days to 124 days. Average lead-time for Production Materials decreased from 67 days to 47 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies increased from 30 days to 31 days.

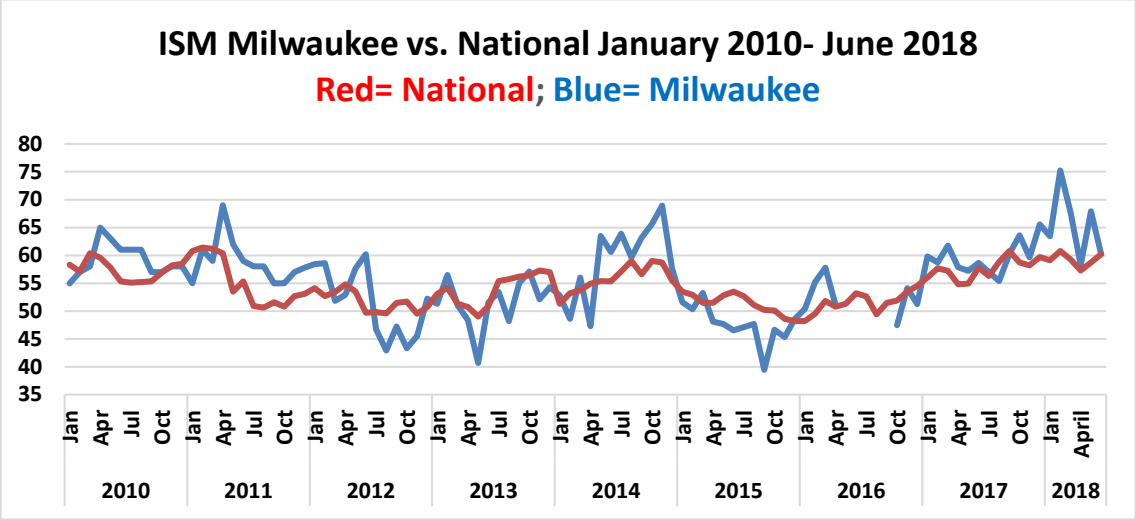
Six- Month Outlook on Business Conditions

In this outlook, there is a downward shift in positive expectations compared with May in terms of market conditions. Approximately 41% of respondents expect positive conditions, 29% expect conditions to remain the same and 29% of the respondents expect conditions to worsen within the next six months.

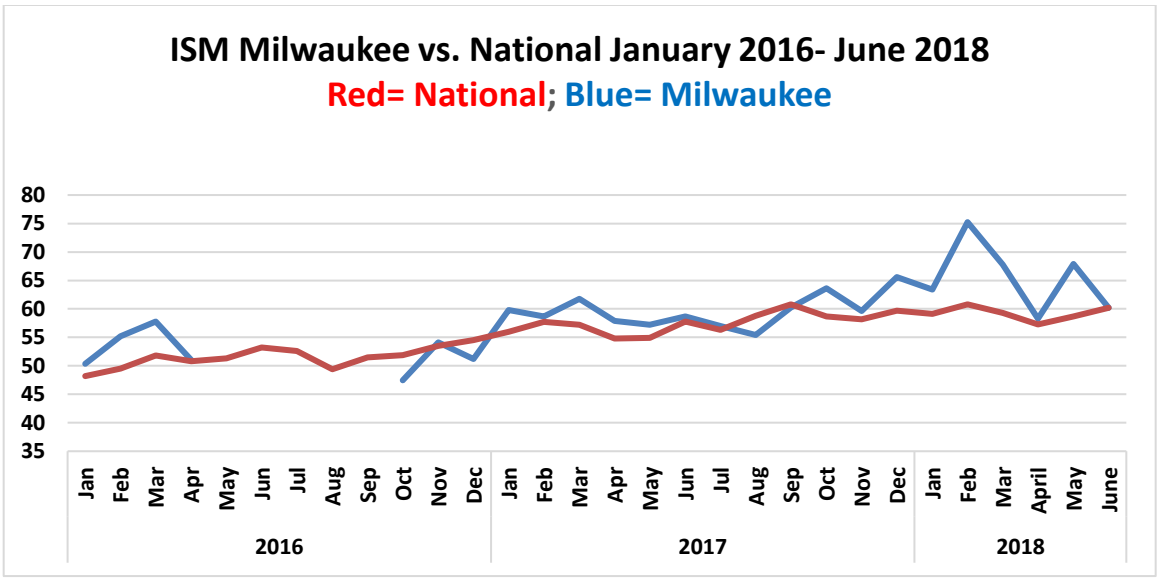
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Jun-18	**41.18%**	**29.41%**	**29.41%**	**55.88%**
May-18	**57.14%**	**35.71%**	**7.14%**	**75.00%**
Apr-18	**30.00%**	**40.00%**	**30.00%**	**50.00%**

Milwaukee versus the Nation –

January 2010 – May 2018 Graph



January 2016- May 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
July 2018- Final Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: July 31st, 2018

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	July 2018	June 2018	May 2018
Seasonally adjusted	61.66	60.18	67.90

(Milwaukee, Wisconsin) – July's Index registered at 61.66, an increase from 60.18 in June. July's Index continues to indicate positive territory.

What respondents are saying in July 2018:

- Continued inflationary pricing increase, opportunistic increases and tariffs impacting costs and difficult to recover from customers.
- Capacity constraints in some categories are growing globally.
- Business is still very good. However, our supply chain is facing numerous issues including inflationary conditions, parts shortages, freight (truck driver) shortages, and poor service.
- Concern remains regarding the uncertainty of section 232 and 301 tariff impact on our business, and the possibility of outright global trade war.
- Global supply constraints of electronic components, purchase order deferrals, and lead time extensions. Tariffs being imposed on product shipping from China.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

What respondents are saying in July 2018:

- Manufacturers are struggling to meet demands.
- Parts shortages are affecting business
- Freight shortages are becoming prevalent.
- Businesses are experiencing electric component constraints, purchase order deferrals, and extended lead times.
- Uncertainty of tariff & raw material costs compared to global competitors

MANUFACTURING AT A GLANCE: July 2018*				
Index	Series Index Jul-18	Series Index Jun-18	Percentage Point Change	Direction
PMI	61.66	60.18	-7.7	growing
New Orders	56.63	61.25	-6.6	growing
Production	56.17	59.33	-11.7	growing
Employment	62.57	60.79	2.7	growing
Supplier Deliveries	80.15	77.86	-1.3	slower
Inventories	52.78	41.67	-21.7	growing
Customers' Inventories *	28.57	36.67	-5.0	declining
Prices *	91.67	88.89	-1.1	growing
Backlog of Orders *	63.33	62.50	-4.2	growing
Exports *	46.15	50.00	-4.5	declining
Imports *	62.50	66.67	1.7	growing

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **May 2018, June 2018, and July 2018.**

	Diffusion Index May-18	Diffusion Index June-18	Diffusion Index Jul-17	Direction	Comments
Blue Collar	61.3	56.0	49.0	declining	-
White Collar	61.3	58.1	57.1	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in July 2018:

- Experiencing difficulties finding labor.
- Would increase (blue collar) if we could find people.

Buying Policy

Average commitment lead-time for Capital Expenditures increased from 124 days to 139 days. Average lead-time for Production Materials increased from 47 days to 57 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies decreased from 31 days to 28 days.

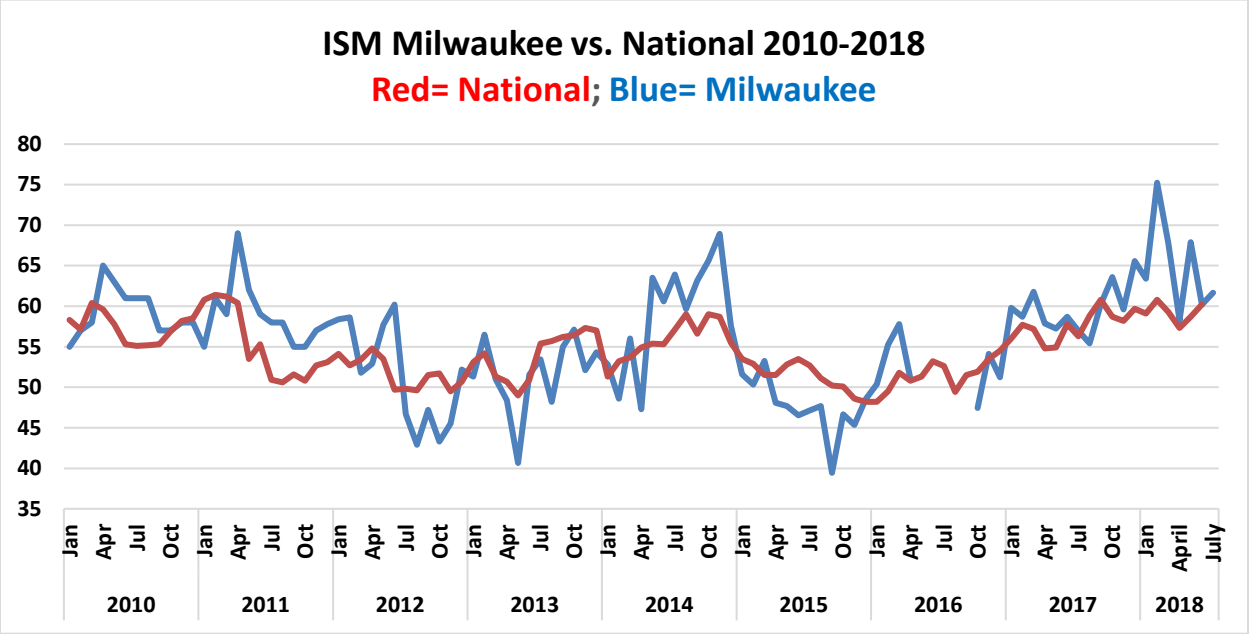
Six- Month Outlook on Business Conditions

In this outlook, there is a downward shift in positive expectations compared with June in terms of market conditions. Approximately 33% of respondents expect positive conditions, 38% expect conditions to remain the same and 28% of the respondents expect conditions to worsen within the next six months.

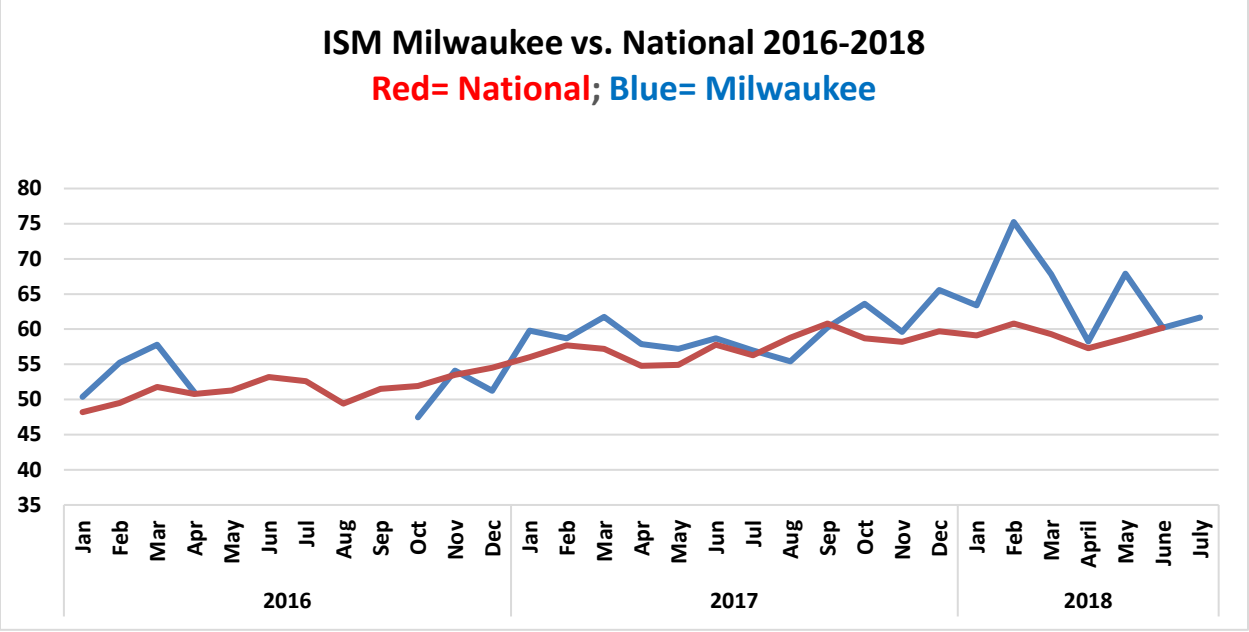
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Jul-18	**33.33%**	**38.89%**	**27.78%**	**52.78%**
Jun-18	**41.18%**	**29.41%**	**29.41%**	**55.88%**
May-18	**57.14%**	**35.71%**	**7.14%**	**75.00%**

Milwaukee versus the Nation –

January 2010 – July 2018 Graph



January 2016- July 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
August 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: August 31st, 2018

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	August 2018	July 2018	June 2018
Seasonally adjusted	64.63	61.66	60.18

(Milwaukee, Wisconsin) – August's Index registered at 64.63, an increase from 61.66 in July. August's Index continues to indicate strong positive territory.

What respondents are saying in August 2018:

- Most orders are holding steady, but few are increasing.
- Several projects have been lost due to tariffs on US imports to China.
- Electronic component shortages and extended lead times creating unplanned costs.
- Inflationary conditions continue.
- Many challenges facing supply chain right now.
- Planning for unplanned costs is an uphill battle.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

MANUFACTURING AT A GLANCE: August 2018*				
Index	Series Index Aug-18	Series Index Jul-18	Percentage Point Change	Direction
PMI	64.63	61.66	3.0	growing
New Orders	65.84	56.63	9.2	growing
Production	61.10	56.17	4.9	growing
Employment	60.06	62.57	-2.5	growing
Supplier Deliveries	82.81	80.15	2.7	slower
Inventories	53.33	52.78	0.6	growing
Customers' Inventories *	29.17	28.57	0.6	declining
Prices *	86.67	91.67	-5.0	growing
Backlog of Orders *	76.92	63.33	13.6	growing
Exports *	54.17	46.15	8.0	growing
Imports *	70.00	62.50	7.5	growing

What respondents are saying in August 2018:

- Rapid increase in material costs and lead times.
- Raw materials continue to see shortages and price increases.
- Shortages of Nylon 66, Lexan Film, stainless steel, and corrugate.

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **June 2018, July 2018, and August 2018.**

	Diffusion Index June-18	Diffusion Index Jul-18	Diffusion Index Aug-18	Direction	Comments
Blue Collar	56.0	49.0	64.4	growing	-
White Collar	58.1	57.1	56.7	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in August 2018:

- Necessary to hire additional sales staff.
- Although new orders are strong, there is a decrease in availability of carriers.
- Many challenges are facing the supply chain.

Buying Policy

Average commitment lead-time for Capital Expenditures decreased from 139 days to 98 days. Average lead-time for Production Materials remained constant at 57 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies decreased from 28 days to 23 days.

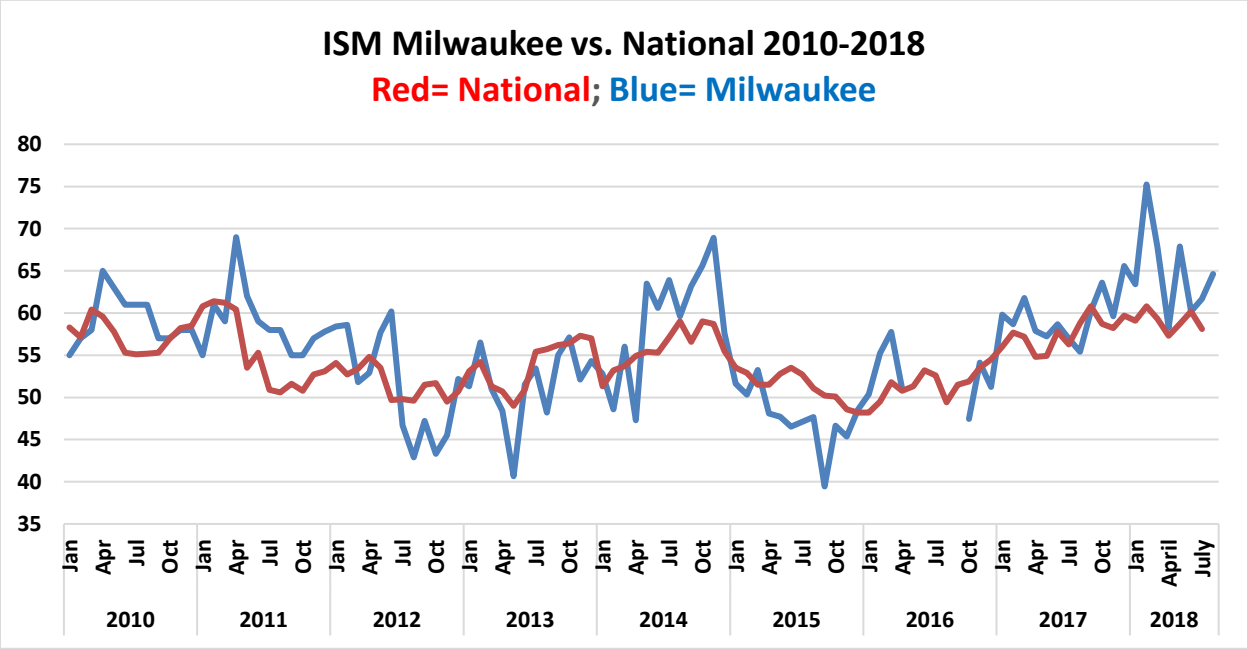
Six- Month Outlook on Business Conditions

In this outlook, there is an upward shift in positive expectations compared with July in terms of market conditions. Approximately 47% of respondents expect positive conditions, 40% expect conditions to remain the same and 13% of the respondents expect conditions to worsen within the next six months.

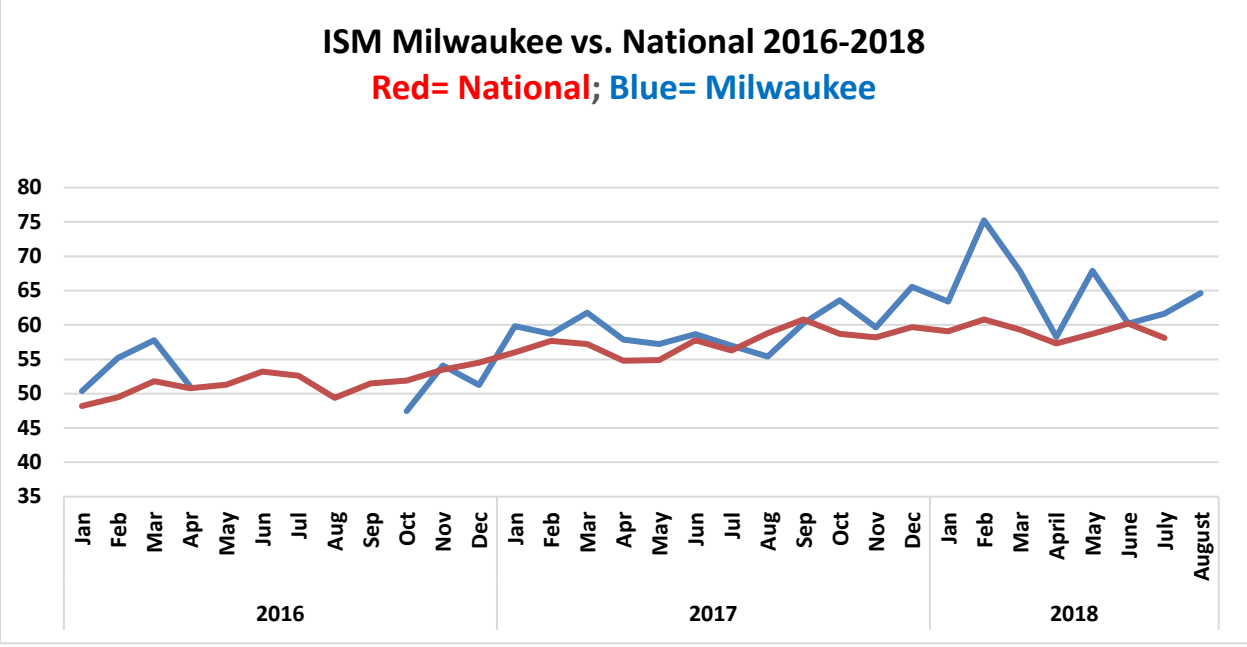
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Aug-18	**46.67%**	**40.00%**	**13.33%**	**66.67%**
Jul-18	**33.33%**	**38.89%**	**27.78%**	**52.78%**
Jun-18	**41.18%**	**29.41%**	**29.41%**	**55.88%**

Milwaukee versus the Nation –

January 2010 – August 2018 Graph



January 2016- August 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
September 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: September 28th, 2018

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	September 2018	August 2018	July 2018
Seasonally adjusted	56.16	64.63	61.66

(Milwaukee, Wisconsin) – September's Index registered at 56.26, a decrease from 64.63 in August. September's Index continues to indicate positive territory.

What respondents are saying in September 2018 (in response to the question: what is the greatest supply chain issue your company is facing?)**:**

- Lack of skilled labor
- Section 301 China Tariffs are going to kill us as 90% of the goods we sell in the U.S. are produced in China. 25% costs adder will be extremely difficult to pass on to the consumer but we will have no choice.
- Cost increases are continuing. Some of the increases are listing the reason as tariffs that have been imposed in 2018. I hope this is a short term issue. If it becomes a long

term issue I should be able to find suppliers that use domestic materials at competitive prices.

- Orders remain strong. Many threats to the supply chain exist including reduced availability of trucks, higher prices, low inventory levels, increasing lead times, and poor customer service.
- Shortage of trucks and drivers is driving up our Supply Chain costs. We are also struggling to find qualified manufacturing labor.
- Current order book is holding but 2019 forecast is very unclear. Customers holding tariff impacts back from their end users until year end - may trigger slow down. Export markets slowing in Brazil, China - market forces and impact of retaliatory tariffs.
- Raw material pricing has been a challenge to say the least this year. We are living in unprecedented times in which supply vs demand is creating turmoil in the electronic components industry. In addition, the tariff impact on product with an origin of China is really taking its toll on our product cost as well as new product development.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

MANUFACTURING AT A GLANCE: September 2018*				
Index	Series Index Sep-18	Series Index Aug-18	Percentage Point Change	Direction
PMI	56.16	64.63	-8.5	growing
New Orders	56.98	65.84	-8.9	growing
Production	51.49	61.10	-9.6	growing
Employment	51.07	60.06	-9.0	growing
Supplier Deliveries	74.04	82.81	-8.8	slower
Inventories	47.22	53.33	-6.1	declining
Customers' Inventories *	34.62	29.17	5.4	declining
Prices *	88.89	86.67	2.2	growing
Backlog of Orders *	56.67	76.92	-20.3	growing
Exports *	45.83	54.17	-8.3	declining
Imports *	65.00	70.00	-5.0	growing

What respondents are saying in September 2018:

- Raw material prices are rising.
- Turmoil in the electronic component industry.
- High prices, low inventory levels, and increasing lead times are hurting the supply chain.
- Commodity and manufacturing lead times are increasing

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **July 2018, August 2018, and September 2018.**

	Diffusion Index Jul-18	Diffusion Index Aug-18	Diffusion Index Sep-18	Direction	Comments
Blue Collar	49.0	64.4	54.3	growing	-
White Collar	57.1	56.7	54.3	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in September 2018:

- Lack of skilled labor.
- Reduced availability of trucks.
- Shortage of trucks and drivers driving up supply chain costs.
- Struggling to find qualified manufacturing labor.

Buying Policy

Average commitment lead-time for Capital Expenditures increased from 98 days to 112 days. Average lead-time for Production Materials increased from 57 days to 61 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies increased from 23 days to 24 days.

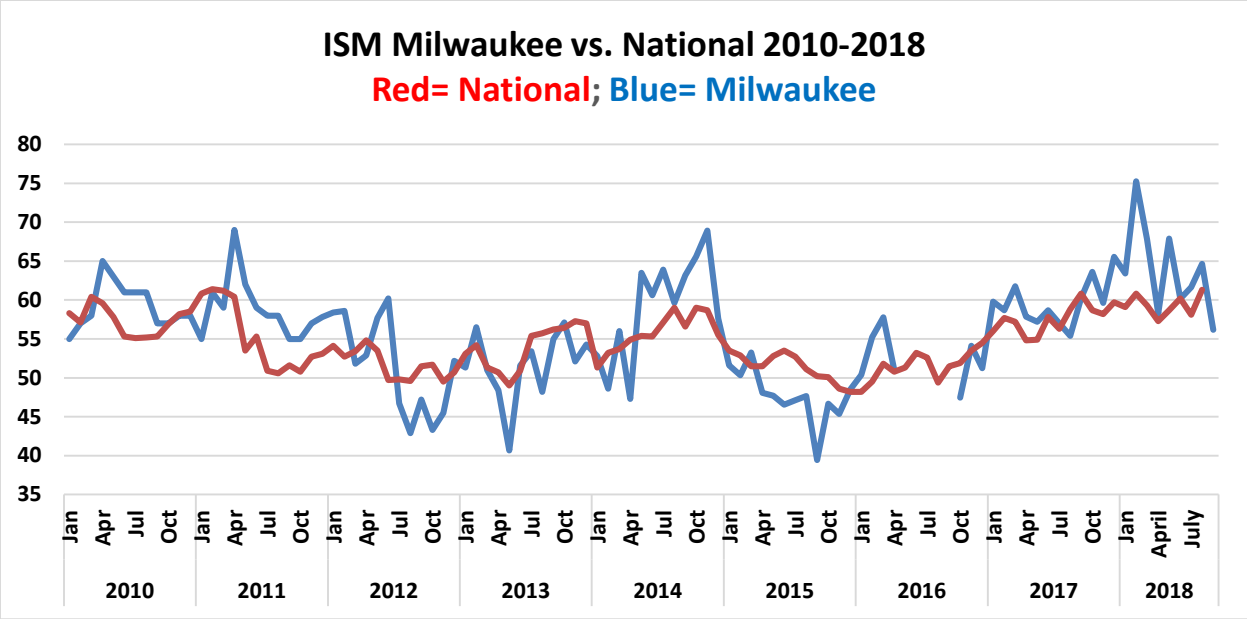
Six- Month Outlook on Business Conditions

In this outlook, there is a downward shift in positive expectations compared with August in terms of market conditions. Approximately 22% of respondents expect positive conditions, 56% expect conditions to remain the same and 22% of the respondents expect conditions to worsen within the next six months.

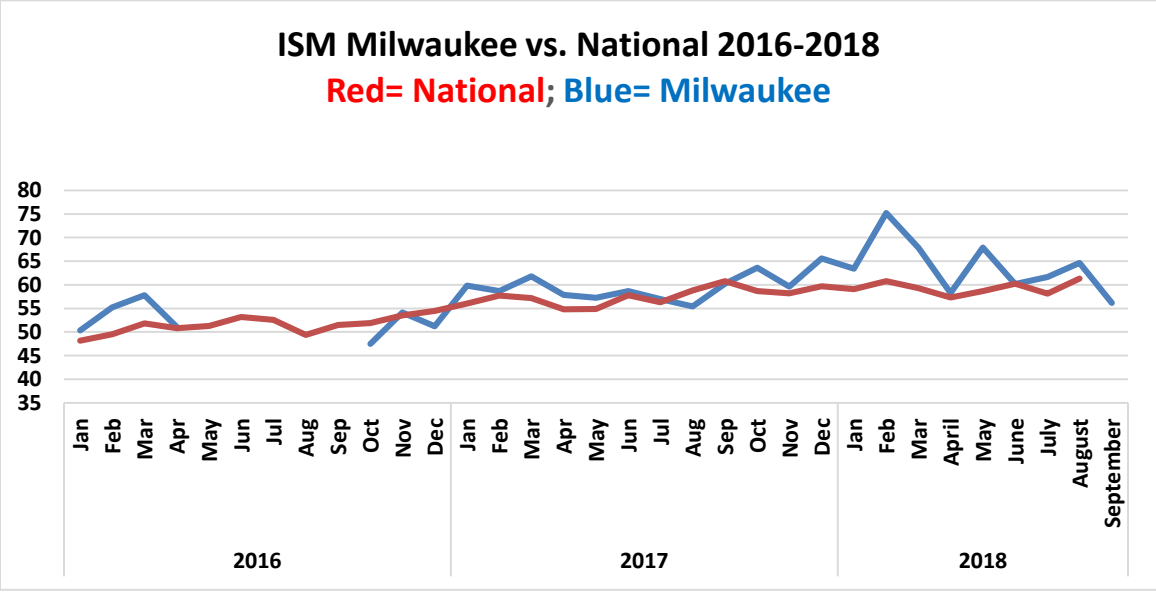
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Sep-18	22.22%	55.56%	22.22%	50.00%
Aug-18	46.67%	40.00%	13.33%	66.67%
Jul-18	33.33%	38.89%	27.78%	52.78%

Milwaukee versus the Nation –

January 2010 – September 2018 Graph



January 2016- September 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
October 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: October 31st, 2018

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	October 2018	September 2018	August 2018
Seasonally adjusted	58.21	56.16	64.63

(Milwaukee, Wisconsin) – October's Index registered at 58.21, an increase from 56.16 in September. October's Index continues to indicate positive territory.

What respondents are saying in October 2018:

- Tariffs are negatively impacting profitability
- High costs, inflation, and reduced supplier inventory are affecting the supply chain
- Hurricane Michael delayed order shipments
- Seems as though the economy is cooling some.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

MANUFACTURING AT A GLANCE: October 2018				
Index	Series Index Oct-18	Series Index Sep-18	Percentage Point Change	Direction
PMI	58.21	56.16	2.0	growing
New Orders	52.69	56.98	-4.3	growing
Production	47.77	51.49	-3.7	declining
Employment	50.66	51.07	-0.4	growing
Supplier Deliveries	73.26	74.04	-0.8	slower
Inventories	66.67	47.22	19.4	growing
Customers' Inventories *	37.50	34.62	2.9	declining
Prices *	80.00	88.89	-8.9	growing
Backlog of Orders *	50.00	56.67	-6.7	neutral
Exports *	31.25	45.83	-14.6	declining
Imports *	62.50	65.00	-2.5	growing

What respondents are saying in October 2018:

- Tariffs are driving significant product re-sourcing
- Export demands are slowing
- The mining market is slowing after some pickup

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **August 2018, September 2018, and October 2018.**

	Diffusion Index Aug-18	Diffusion Index Sep-18	Diffusion Index Oct-18	Direction	Comments
Blue Collar	64.4	54.3	50.7	growing	-
White Collar	56.7	54.3	47.3	declining	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in October 2018:

- Slowing demand is allowing suppliers to catch up with orders
- Customers will adjust prices in December, causing uncertainty in demand planning
- Reduced quality of supplier inputs

Buying Policy

Average commitment lead-time for Capital Expenditures decreased from 112 days to 82 days. Average lead-time for Production Materials decreased from 61 days to 53 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies remained constant at 24 days.

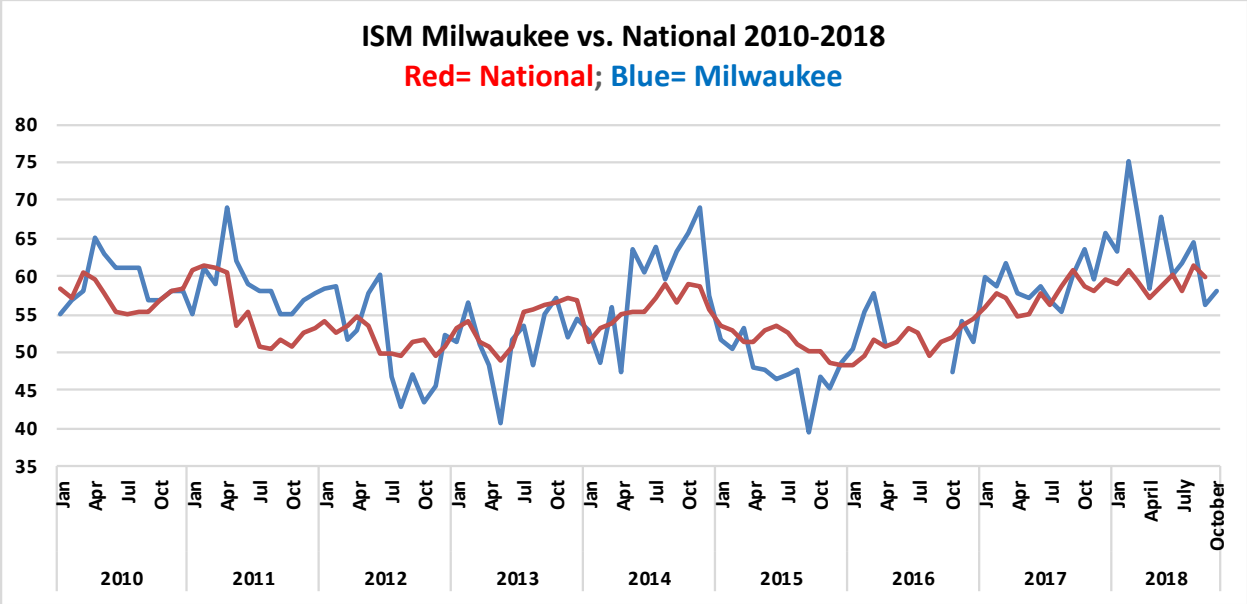
Six- Month Outlook on Business Conditions

In this outlook, there is an upward shift in positive expectations compared with September in terms of market conditions. Approximately 33% of respondents expect positive conditions, 33% expect conditions to remain the same and 33% of the respondents expect conditions to worsen within the next six months.

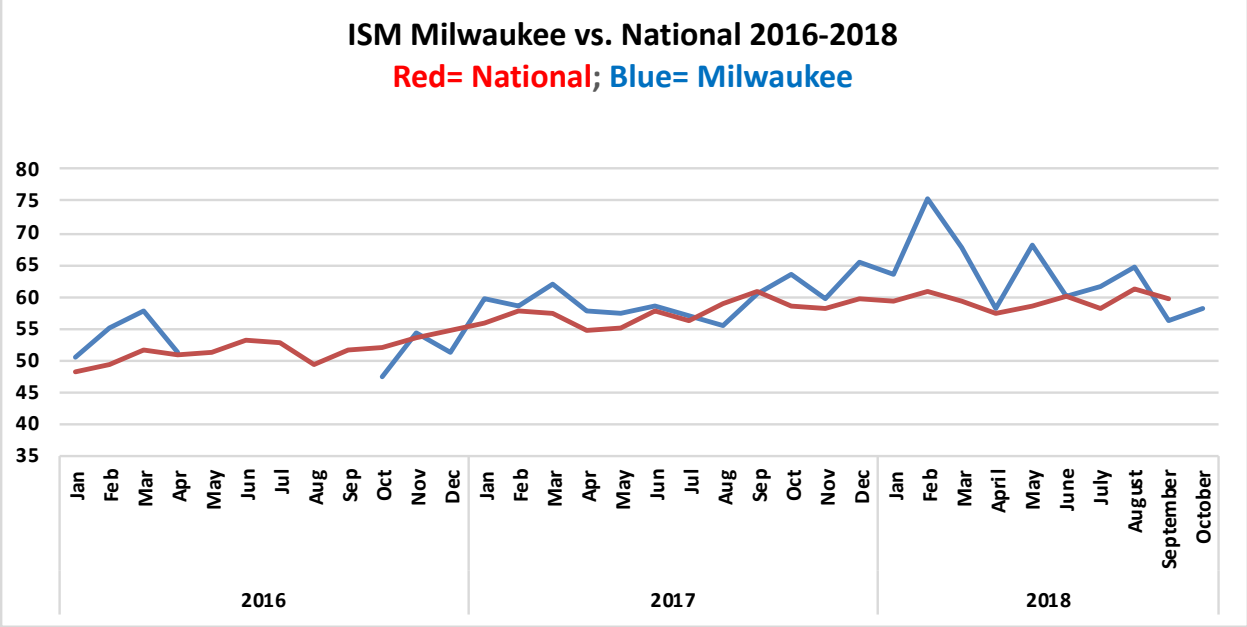
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Oct-18	**33.33%**	**33.33%**	**33.33%**	**50.00%**
Sep-18	**22.22%**	**55.56%**	**22.22%**	**50.00%**
Aug-18	**46.67%**	**40.00%**	**13.33%**	**66.67%**

Milwaukee versus the Nation –

January 2010 – October 2018 Graph



January 2016- October 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
November 2018- Early Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: November 30th, 2018

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	November 2018	October 2018	September 2018
Seasonally adjusted	56.63	58.21	56.16

(Milwaukee, Wisconsin) – November's Index registered at 56.63, an increase from 58.21 in October. November's Index continues to indicate positive territory.

What respondents are saying in November 2018:

- Advancing inflationary conditions and significant price increases
- Growth projections for 2019 have been reversed
- Prices rising due to equipment shortages
- Supplier capacity constrains led to more aggressive pricing

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

MANUFACTURING AT A GLANCE: November 2018*				
Index	Series Index Nov-18	Series Index Oct-18	Percentage Point Change	Direction
PMI	56.63	58.21	-1.6	growing
New Orders	35.39	52.69	-17.3	declining
Production	51.28	47.77	3.5	growing
Employment	64.63	50.66	14.0	growing
Supplier Deliveries	75.21	73.26	2.0	slower
Inventories	56.67	66.67	-10.0	growing
Customers' Inventories *	30.77	37.50	-6.7	declining
Prices *	83.33	80.00	3.3	growing
Backlog of Orders *	46.15	50.00	-3.8	declining
Exports *	50.00	31.25	18.8	neutral
Imports *	72.22	62.50	9.7	growing

What respondents are saying in November 2018:

- Customers overbought in response to tariffs
- Cost constraints have been a challenge with electronic components
- Reductions in plastic production are causing backorders and higher prices
- Insufficient plastic material inventories will drive the development of new technologies

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **September 2018, October 2018, and November 2018.**

	Diffusion Index Sep-18	Diffusion Index Oct-18	Diffusion Index Nov-18	Direction	Comments
Blue Collar	54.3	50.7	61.2	growing	-
White Collar	54.3	47.3	57.8	declining	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in November 2018:

- Prices are escalating due to driver shortages
- Premium charges on trucking
- Customers not confident in 2019 forecasts and reducing plans

Buying Policy

Average commitment lead-time for Capital Expenditures increased from 82 days to 137 days. Average lead-time for Production Materials decreased from 53 days to 49 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies increased from 24 days to 25 days.

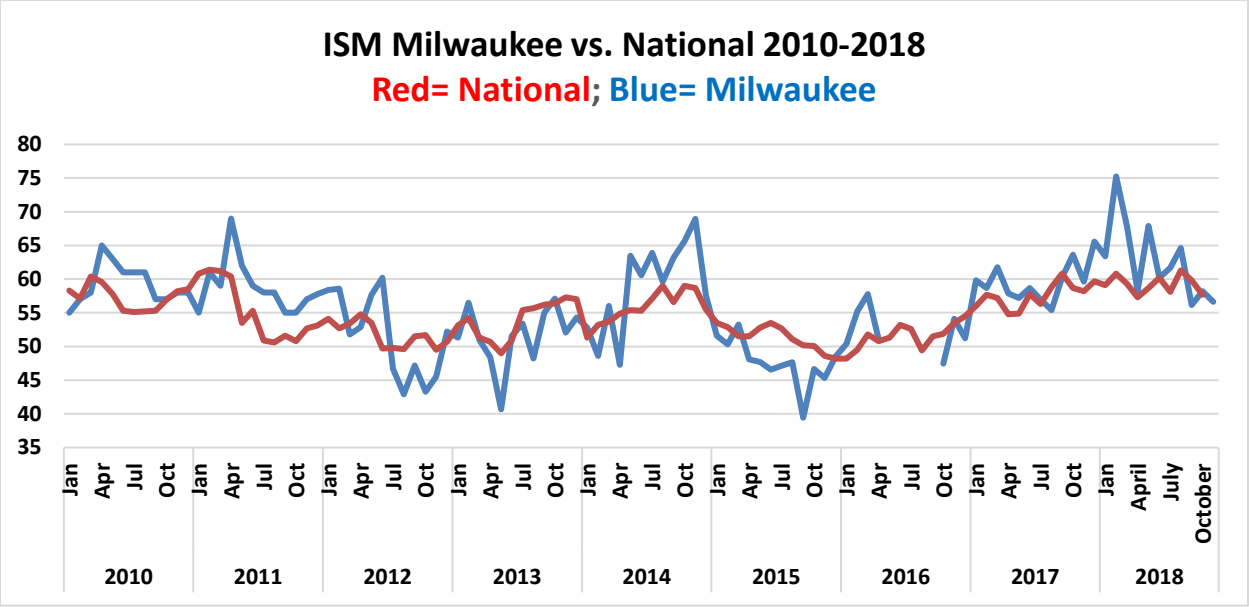
Six- Month Outlook on Business Conditions

In this outlook, there is an upward shift in positive expectations compared with October in terms of market conditions. Approximately 36% of respondents expect positive conditions, 29% expect conditions to remain the same and 36% of the respondents expect conditions to worsen within the next six months.

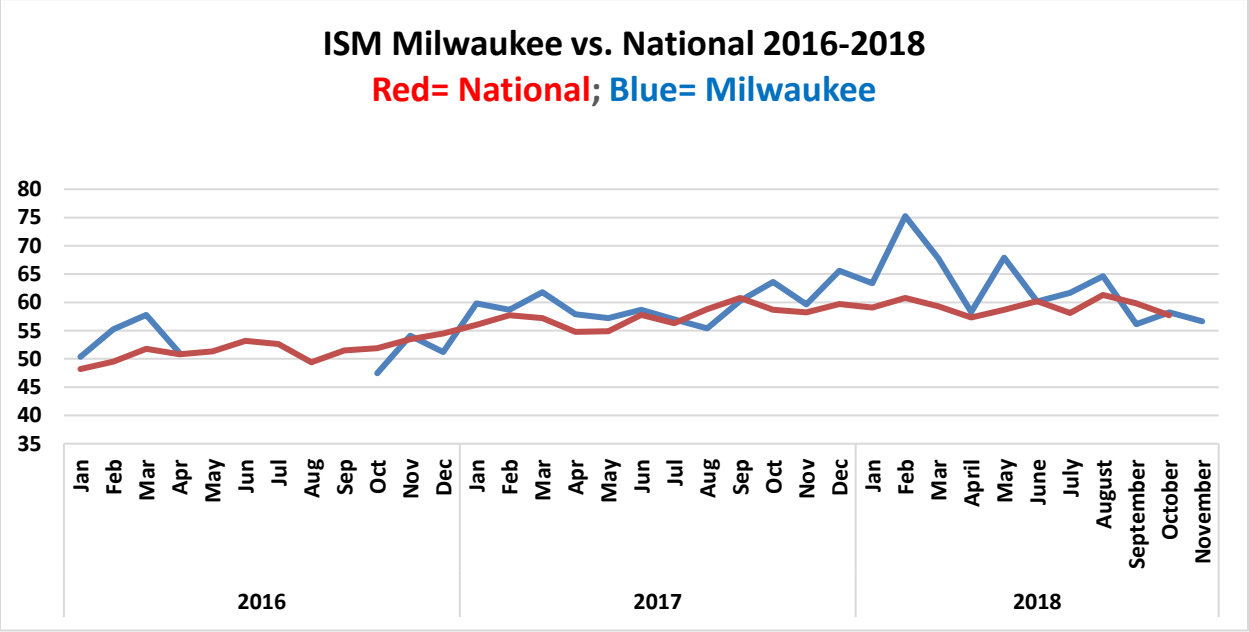
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Nov-18	**35.71%**	**28.57%**	**35.71%**	**50.00%**
Oct-18	**33.33%**	**33.33%**	**33.33%**	**50.00%**
Sep-18	**22.22%**	**55.56%**	**22.22%**	**50.00%**

Milwaukee versus the Nation –

January 2010 – November 2018 Graph



January 2016- November 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)

MARQUETTE UNIVERSITY | BUSINESS
Center for Supply Chain Management

ISM institute for supply management
ISM—Milwaukee, Inc.

Marquette-ISM Report on Manufacturing
December 2018- Final Release

Contact: Dr. Douglas Fisher
Director, Center for Supply Chain Management
Marquette University
(414) 288-3995
douglas.fisher@marquette.edu

Released: December 31, 2018

*The Marquette-ISM Report on Manufacturing was prepared by **Gwendolyn Davis**, a graduate student in Applied Economics at Marquette University, and distributed by **Melanie Roepke**, Associate Director of the Center for Supply Chain Management.*

Please direct data questions and requests for media commentary to Dr. Fisher.

This report should not be confused with the ISM National Report published by the Institute of Supply Management. While a reasonable attempt has been made to remain consistent with the national report, the contents of this report reflect only information pertinent to the southeast Wisconsin and northern Illinois region. This report is not used in the calculation of the national report.

Summary

Milwaukee-area PMI	December 2018	November 2018	October 2018
Seasonally adjusted	52.87	56.63	58.21

(Milwaukee, Wisconsin) – December's Index registered at 52.87, a decrease from 56.63 in November. December's Index continues to indicate positive territory.

What respondents are saying in December 2018:

- We are looking forward to another record year for 2019.
- Slight increases continue in Q1 but clear uncertainty in domestic & China demand thereafter. Export demand to India and Brazil softening.
- All planned 2019 increases from 2018 have been reversed.
- Many issues facing the supply chain continue, despite suddenly sluggish sales. Increasing costs, longer lead times, poor quality, and reduced customer service still are major concerns. Availability of trucking equipment and personnel are also issues.

Important: See explanatory notes on the survey and diffusion index at the end of this report.

(*) The indices are seasonally adjusted *except for* the Customers' Inventories, Prices, Backlog of Orders, Exports, and Imports Indexes, which do not meet the accepted criteria for seasonal adjustments.

MANUFACTURING AT A GLANCE: December 2018*				
Index	Series Index Dec-18	Series Index Nov-18	Percentage Point Change	Direction
PMI	52.87	56.63	-3.8	growing
New Orders	36.30	35.39	0.9	declining
Production	46.59	51.28	-4.7	declining
Employment	52.03	64.63	-12.6	growing
Supplier Deliveries	76.30	75.21	1.1	slower
Inventories	53.13	56.67	-3.5	growing
Customers' Inventories *	32.14	30.77	1.4	declining
Prices *	71.88	83.33	-11.5	growing
Backlog of Orders *	53.85	46.15	7.7	growing
Exports *	50.00	50.00	0.0	neutral
Imports *	56.25	72.22	-16.0	growing

What respondents are saying in December 2018:

- Supplier capacity constraints led to aggressive pricing.
- Customers overbought in response to tariffs.
- Insufficient specialty plastic material inventories will likely continue far into the new year.
- Alternative plastic feedstocks will be developed in response to backorders and high prices.
- Cost constraints were an overall challenge in 2018.
- Continued inflationary conditions have been a major issue for the supply chain.
- Significant price increases for all material inputs.
- Logistics problems continue.
- Rising cost of transportation and shortage of drivers and trucks.
- Prices escalating due to driver and trucking shortages.
- Premium charges are being spent on trucking.

Blue and White-Collar Employment:

We have collected input on Blue and White Collar Employment. The indices are below for **October 2018, November 2018, and December 2018.**

	Diffusion Index Oct-18	Diffusion Index Nov-18	Diffusion Index Dec-18	Direction	Comments
Blue Collar	50.7	61.2	52.0	growing	-
White Collar	47.3	57.8	58.5	growing	-

Note: These have been calculated based on the seasonally adjusted (SA) Blue and White Collar indices.

What respondents are saying in December 2018:

- Looking to automate where ever possible as we anticipate a protracted labor shortage
- The largest issue that our industry faces is lack of qualified help. Every link of the chain is constrained by lack of help We could be producing a lot more if we could fill positions. Our forgers are "lemoning" along, not able to add shifts because of no help. Steel production is lagging because of no help.

Buying Policy

Average commitment lead-time for Capital Expenditures decreased from 137 days to 110 days. Average lead-time for Production Materials decreased from 49 days to 48 days. Average lead-time for Maintenance, Repair and Operating (MRO) Supplies remained at 24 days.

Six- Month Outlook on Business Conditions

In this outlook, there is an upward shift in positive expectations compared with November in terms of market conditions. Approximately 38% of respondents expect positive conditions, 31% expect conditions to remain the same and 31% of the respondents expect conditions to worsen within the next six months.

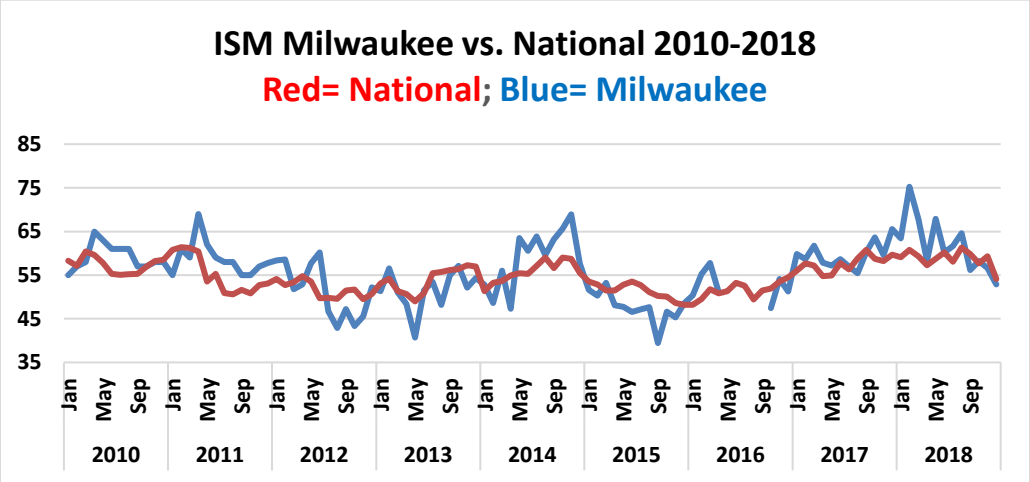
	Expect Positive Conditions	Expect Same Conditions	Expect Worse Conditions	Diffusion Index
Dec-18	**37.50%**	**31.25%**	**31.25%**	**53.13%**
Nov-18	**35.71%**	**28.57%**	**35.71%**	**50.00%**
Oct-18	**33.33%**	**33.33%**	**33.33%**	**50.00%**

What respondents are saying in December 2018:

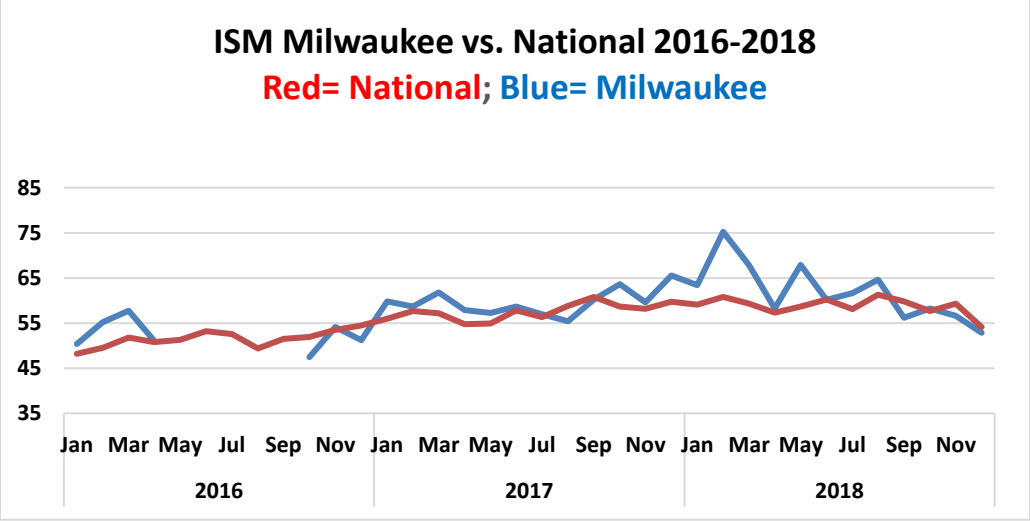
- All of our customers except automotive predict an even better 2019
- Seems to be some doubt in the economy going forward due to political tension and lingering tariff issues

Milwaukee versus the Nation –

January 2010 – December 2018 Graph



January 2016- December 2018 Graph



Insights on the ISM PMI from the National Organization:

ISM *Manufacturing Report On Business*® Background

In February 1982, the PMI was developed by the U.S. Department of Commerce (DOC) and ISM. The index, based on analytical work by the DOC, adjusts five components of the Institute's monthly survey — new orders, production, employment, supplier deliveries and inventories — for normal seasonal variations, applies equal weights to each and then calculates them into a single monthly index number.

An update of research originally done by Theodore S. Torda, the late economist for the DOC, shows a close parallel between growth in real Gross Domestic Product (GDP) and the PMI. The index can explain about 60 percent of the annual variation in GDP, with a margin of error that averaged ± .48 percent during the last ten years. George McKittrick, an economist at the DOC, said "Not only does the PMI track well with the overall economy, but the indication provided by ISM data about how widespread changes are, complements analogous government series that show size and direction of change."

In January 1989, the Supplier Deliveries Index from the *Report* became a standard element of the DOC's Bureau of Economic Analysis Index of Leading Economic Indicators. The data was incorporated into the index from June 1976 forward. In January 1996, The Conference Board began compiling this index.

What Is a Diffusion Index?

Diffusion indexes have the properties of leading indicators and are convenient summary measures showing the prevailing direction of change. The percent response to the “Better,” “Same” or “Worse” question is difficult to compare to prior periods. Therefore, the percentages are “diffused” for this purpose. A diffusion index takes those indicating “Better” and half of those indicating “Same” and adds the percentages. This effectively measures the bias toward a positive (above 50 percent) or negative index (below 50 percent). For example, if the response is 20 percent “Better,” 70 percent “Same,” and 10 percent “Worse,” then the diffusion index would be 55 percent (20% + [0.50 x 70%]). The data for each question is converted to a diffusion index and then seasonally adjusted.

For each index, a reading above 50 percent indicates expansion of an index, while a reading below 50 percent indicates it is generally declining. And a reading of 50 percent indicates “no change” from the previous month. Supplier Deliveries is an exception. A Supplier Deliveries Index above 50 percent indicates slower deliveries, and below 50 percent indicates faster deliveries.

(https://www.instituteforsupplymanagement.org/files/ISMREPORT/ROBBroch08.pdf)