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## Identificación en el cambio del poder de negociación en agente libres de la MLB -Estadísticas Descriptivas.

Maestría en Economía Centro de Investigación y Docencias Económicas.

## Antonio Huerta Montellano



Supervisada por Dr. Sonia Di Giannatale

#### Resumen

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## Índice

Apéndice			VI
Α.	Esta	ndísticas descriptivas	VI
	A.1.	Diagramas de caja	VI
		A.1.1. Estadísticas deportivas acumuladas - Bateadores	VI
		A.1.2. Estadísticas deportivas acumuladas - Filderos	
		A.1.3. Estadísticas deportivas por juego - Bateadores	
		A.1.4. Estadísticas deportivas por juego - Filderos	
		A.1.5. Estadísticas deportivas por cada 10 juegos - Bateadores	
		A.1.6. Estadísticas deportivas por cada 10 juegos - Filderos	
		A.1.7. Datos contractuales - Bateadores	
		A.1.8. Datos contractuales - Fielder	
		A.1.9. Datos generales - Bateadores	
		A.1.10. Datos generales - Feilders	
	A.2.	Diagramas de densidad	
		A.2.1. Estadísticas deportivas acumuladas - Bateadores	
		A.2.2. Estadísticas deportivas acumuladas - Filderos	
		A.2.3. Estadísticas deportivas promediadas anualmente - Bateadores .	
		A.2.4. Estadísticas deportivas promediadas anualmente - Filderos	
		A.2.5. Estadísticas deportivas por juego - Bateadores	
		A.2.6. Estadísticas deportivas por juego - Filderos	
		A.2.7. Estadísticas deportivas por juego - Bateadores	
		A.2.8. Estadísticas deportivas por cada 10 juegos - Filderos	
		A.2.9. Datos contactuales - Hitters	
		A.2.10 Datos contactuales - Fielders	
		A.2.11. Datos generales - Bateadores	
	4.0	A.2.12. Datos generales - Fielders	
	A.3.	Series de tiempo	
		A.3.1. Estadísticas deportivas acumuladas - Bateadores	
		A.3.2. Estadísticas deportivas acumuladas - Filderos	
		A.3.3. Estadísticas deportivas por juego - Bateadores	
		A.3.4. Estadísticas deportivas por juego - Filderos	
		A.3.5. Estadísticas deportivas por cada 10 juegos - Bateadores	
		A.3.6. Estadísticas deportivas por cada 10 juegos - Filderos	
		A.3.7. Salarios - Bateadores	
		A.3.8. Salarios - Fielders	ACII
B. Resultados de las regresiones			XCII
C. Estimaciones directas			XCII

# Índice de figuras

## Índice de cuadros

## **Apéndice**

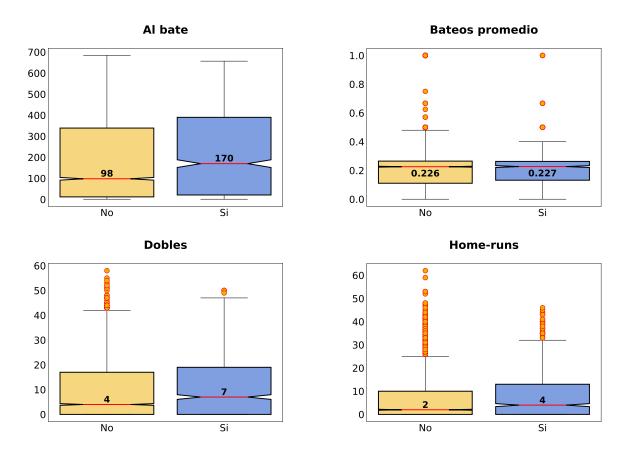
El propósito de abordar la terminología y reglas que rigen un partido de béisbol en este apéndice es proporcionar al lector una base con la cual pueda entender mejor el análisis, decisiones y conclusiones que se hacen a lo largo de este trabajo. Sin embargo, tampoco se explicarán términos que no sean considerados útiles para estos propósitos.

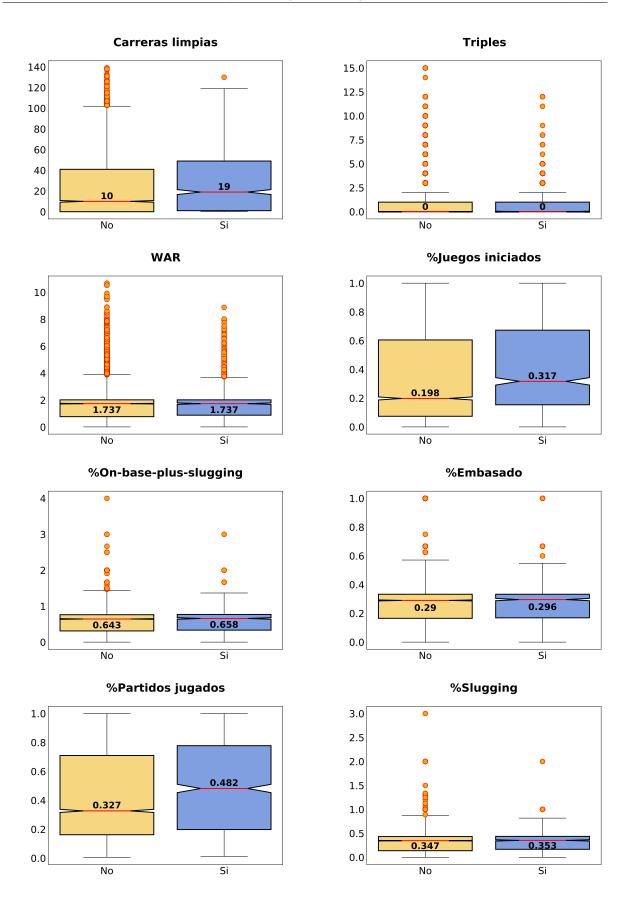
## A. Estadísticas descriptivas

## A.1. Diagramas de caja

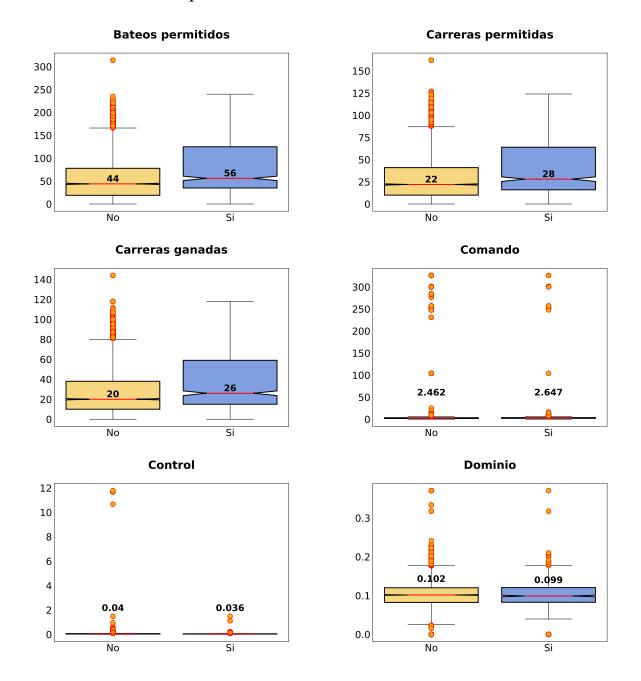
Comparación con diagramas de caja entre los jugadores que son agentes libres (Si) y los no-agentes libres (No) con respecto a las estadísticas deportivas, salarios y datos generales. Se tomaron los promedios a lo largo de todos los años que abarca la base de datos.

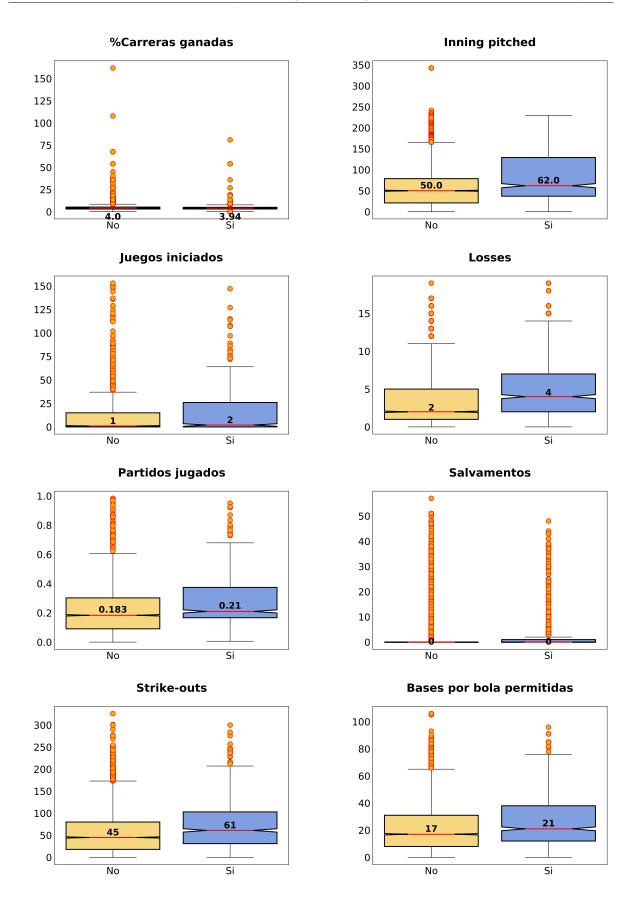
#### A.1.1. Estadísticas deportivas acumuladas - Bateadores

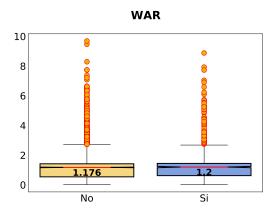


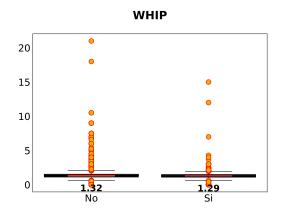


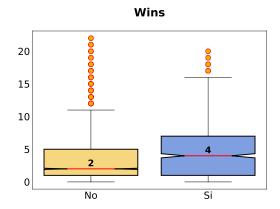
## A.1.2. Estadísticas deportivas acumuladas - Filderos



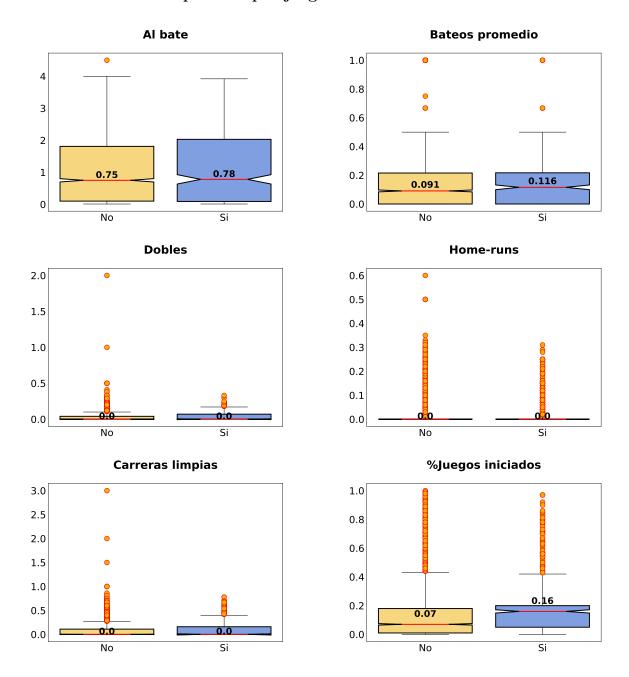


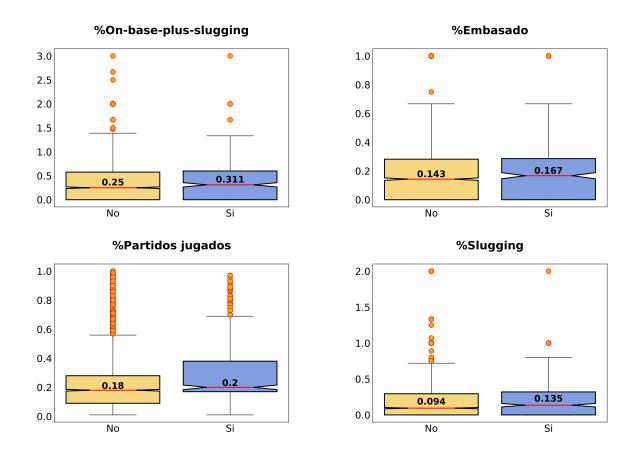




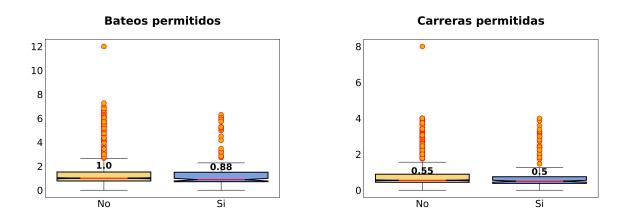


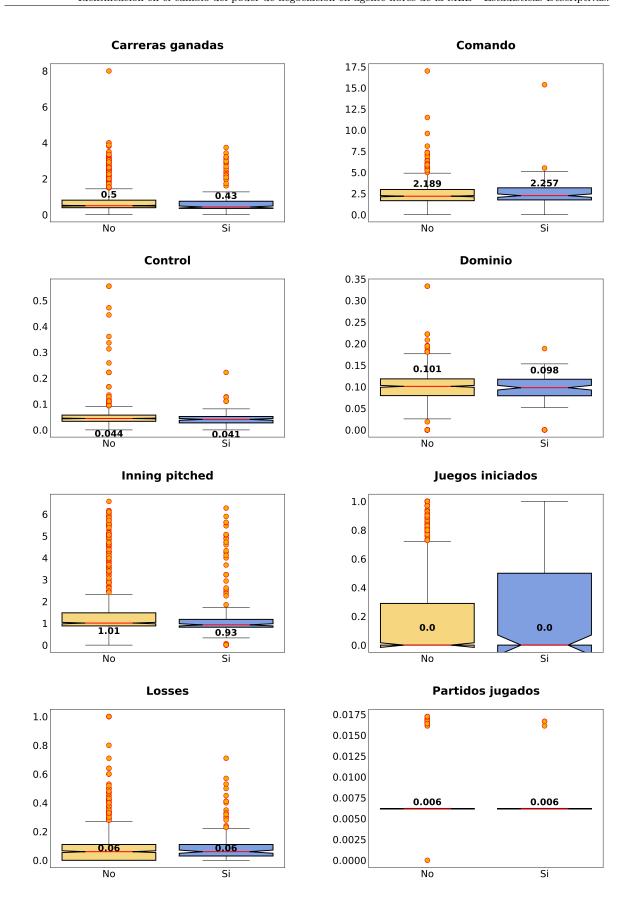
## A.1.3. Estadísticas deportivas por juego - Bateadores

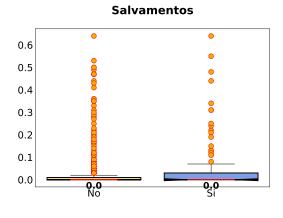


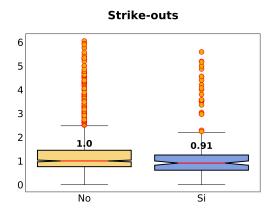


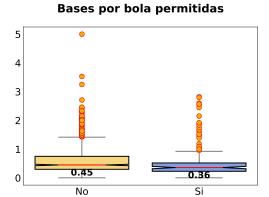
### A.1.4. Estadísticas deportivas por juego - Filderos

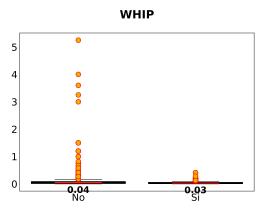


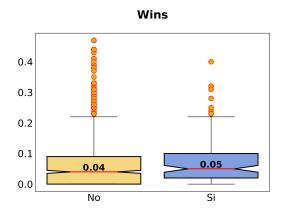




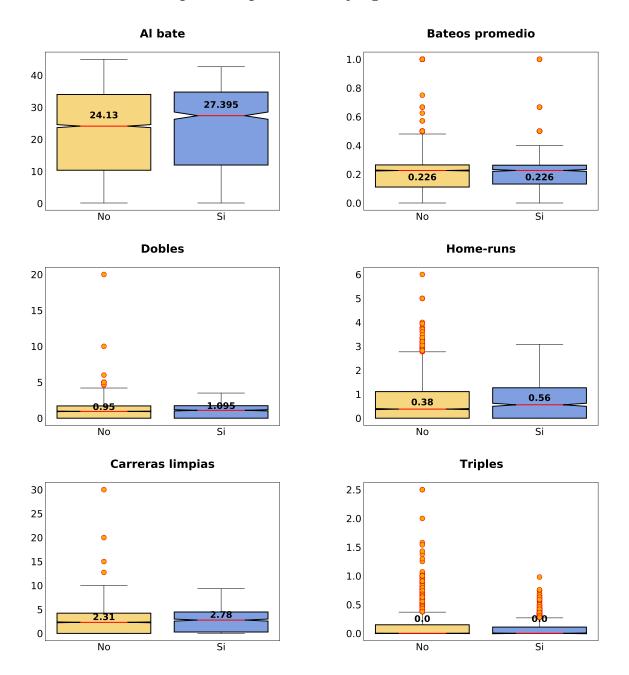




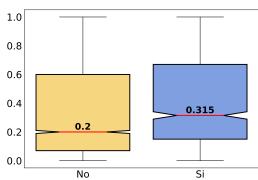




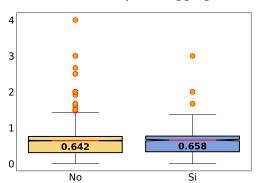
## A.1.5. Estadísticas deportivas por cada 10 juegos - Bateadores



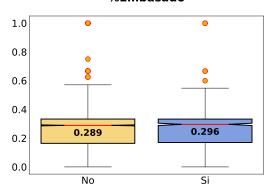
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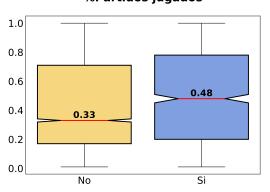
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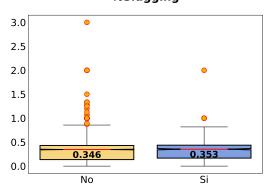
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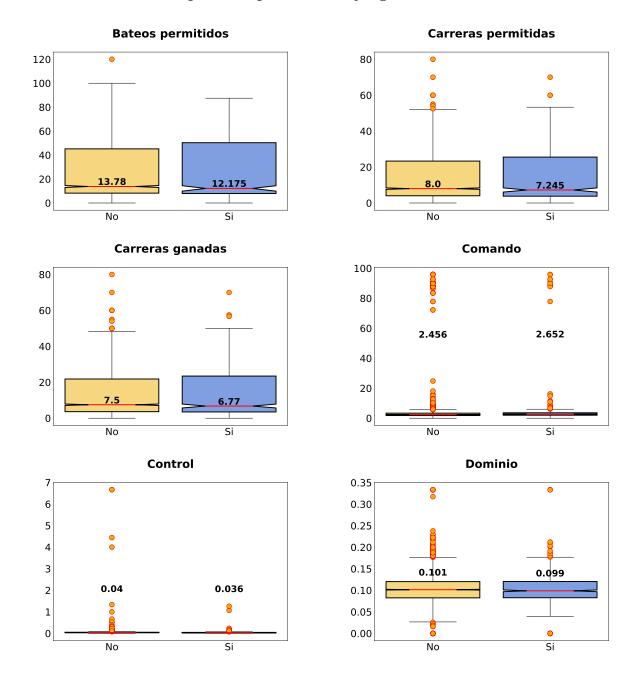
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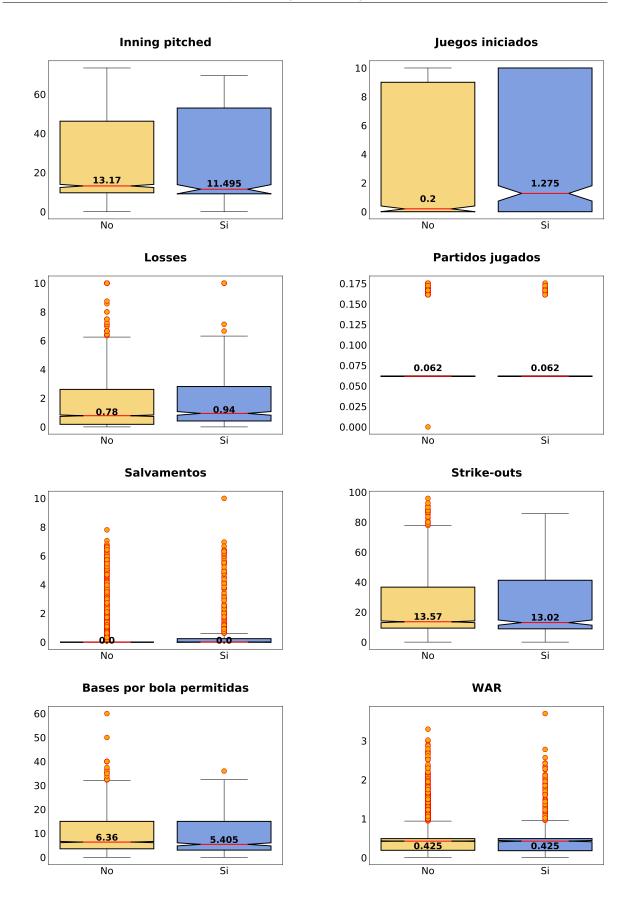


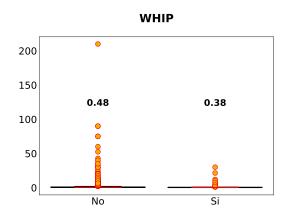
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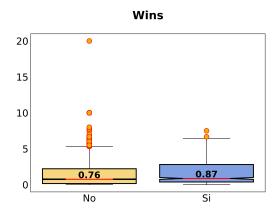


## A.1.6. Estadísticas deportivas por cada 10 juegos - Filderos

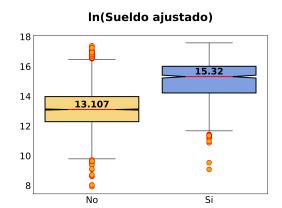


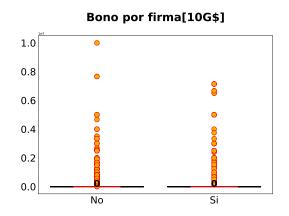


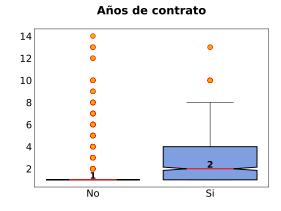


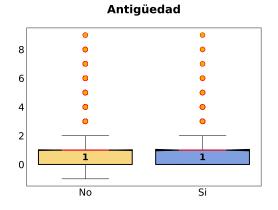


#### A.1.7. Datos contractuales - Bateadores

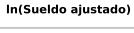


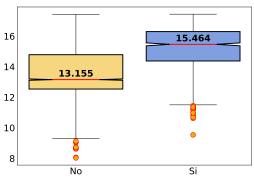


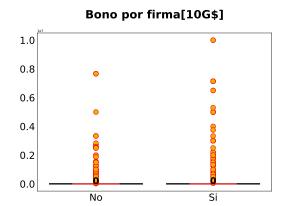




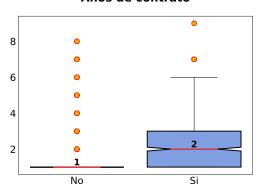
## A.1.8. Datos contractuales - Fielder



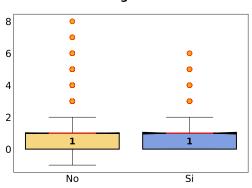




#### Años de contrato

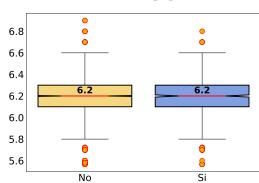


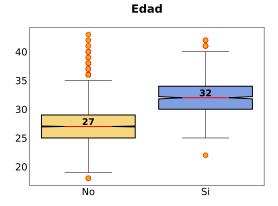
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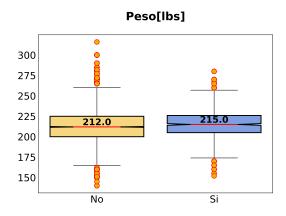


#### A.1.9. Datos generales - Bateadores

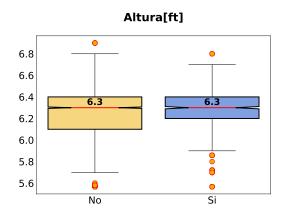
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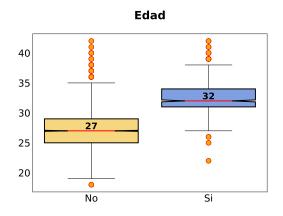


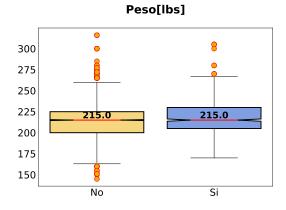




## A.1.10. Datos generales - Feilders



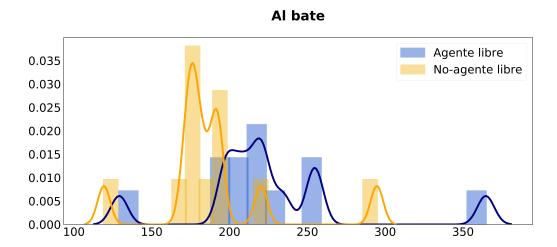




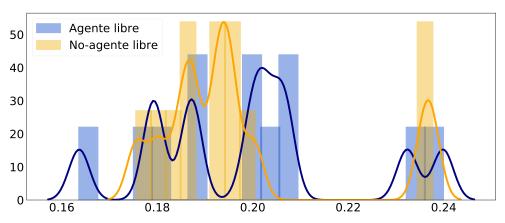
## A.2. Diagramas de densidad

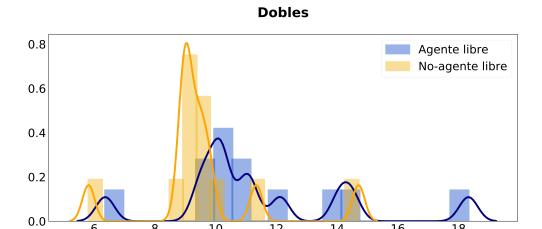
De manera similar a la sección sobre los diagramas de caja, los jugadores que son agentes libres se etiquetan con un Si y, en caso contrario, con un No. Se muestran los diagramas de densidad de las estadísticas deportivas, salarios y datos generales. Se tomaron los promedios de todos los años que abarca la base de datos.

#### A.2.1. Estadísticas deportivas acumuladas - Bateadores

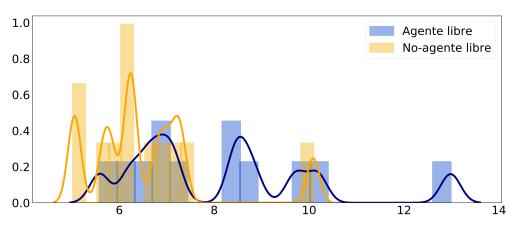




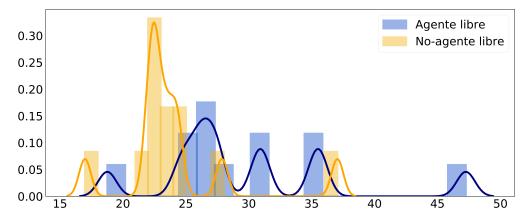




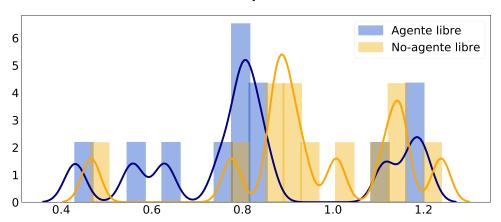
#### **Home-runs**



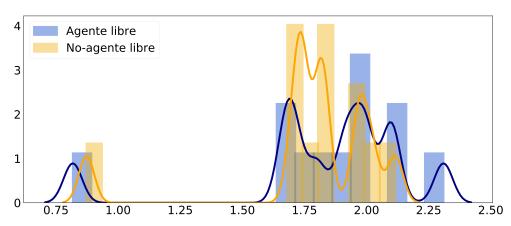
## **Carreras limpias**



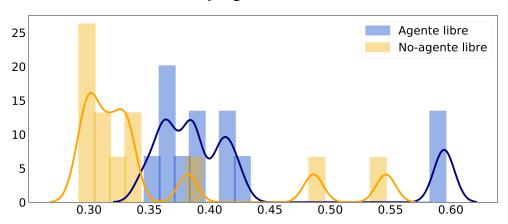




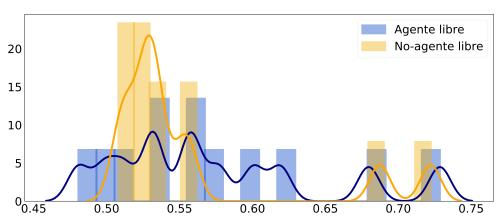
#### **WAR**



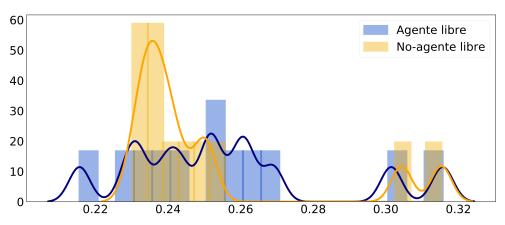
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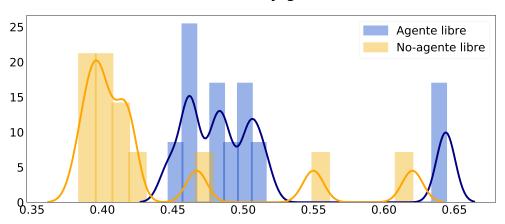
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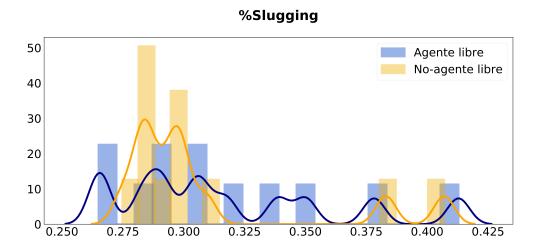


#### %Embasado



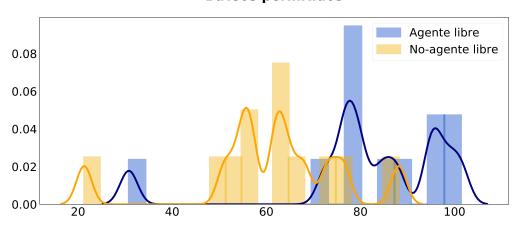
#### **%Partidos jugados**



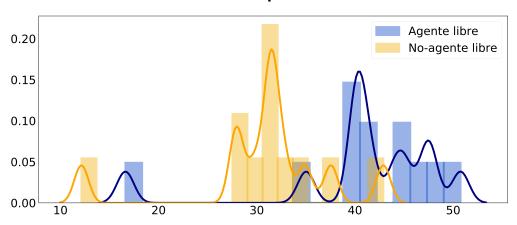


## A.2.2. Estadísticas deportivas acumuladas - Filderos

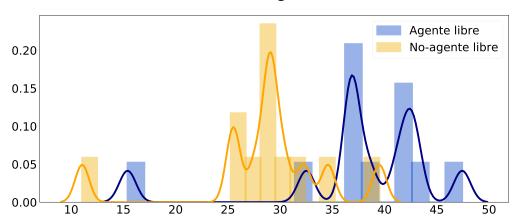
#### **Bateos permitidos**



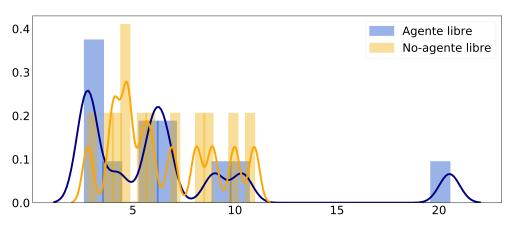
#### Carreras permitidas



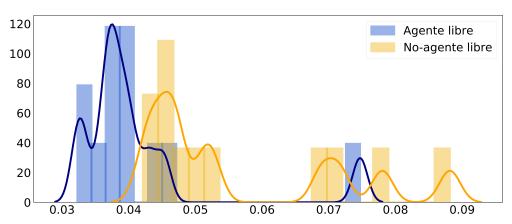
#### **Carreras ganadas**



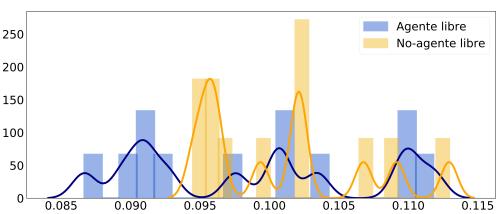
#### Comando



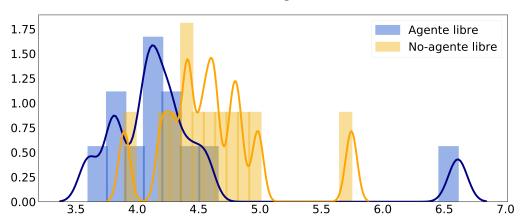
#### Control



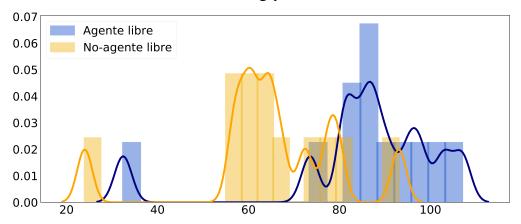




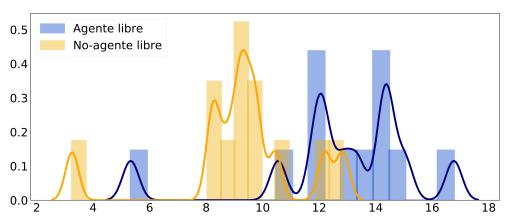
#### **%Carreras ganadas**



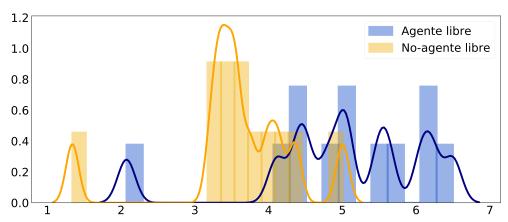
#### **Inning pitched**



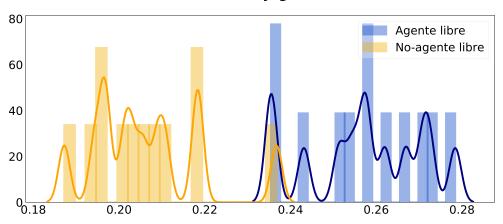
## Juegos iniciados



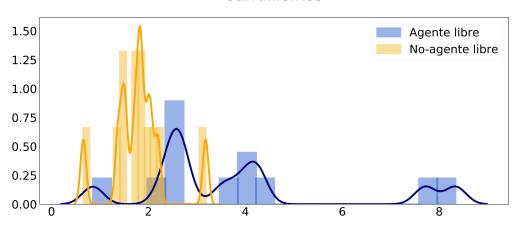
#### Losses



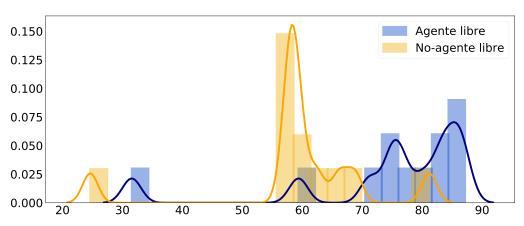
## Partidos jugados



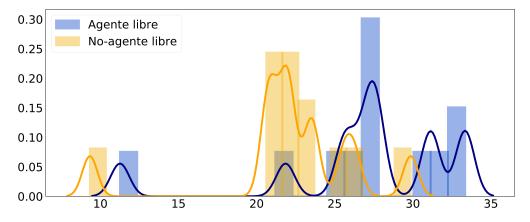
#### **Salvamentos**

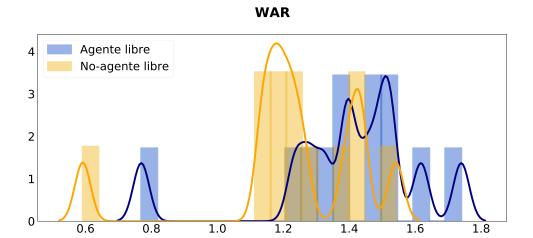


#### Strike-outs

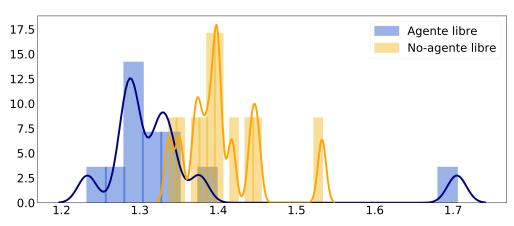


#### Bases por bola permitidas

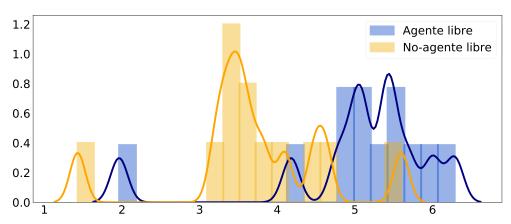




#### **WHIP**

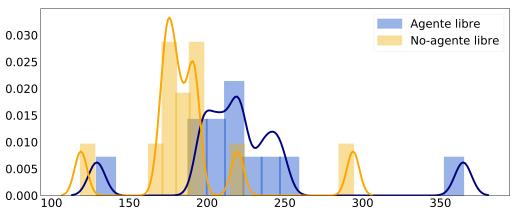


#### Wins

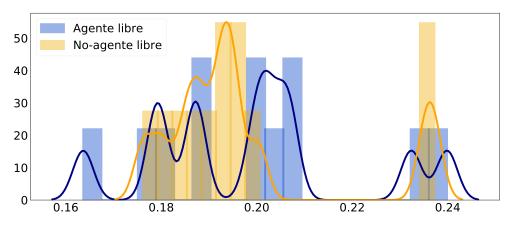


## A.2.3. Estadísticas deportivas promediadas anualmente - Bateadores

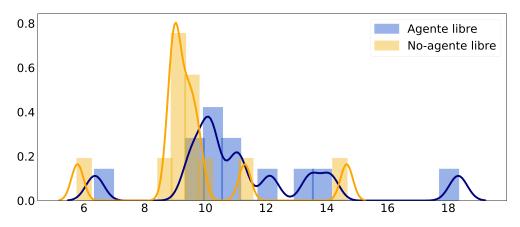




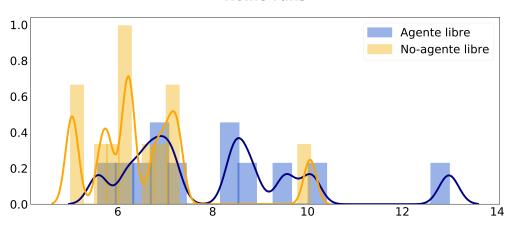
### **Bateos promedio**



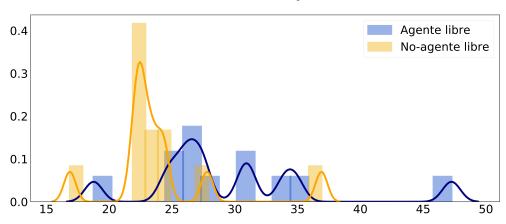
#### **Dobles**



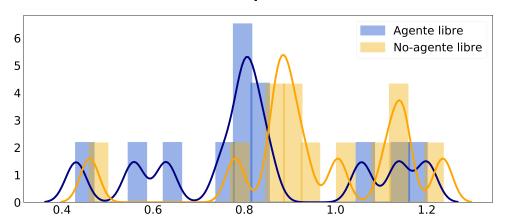
#### **Home-runs**



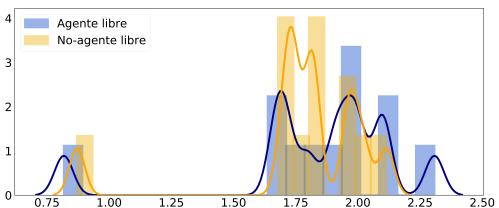
### **Carreras limpias**



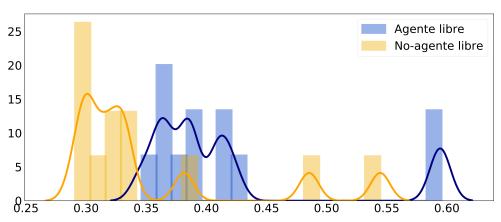
#### **Triples**



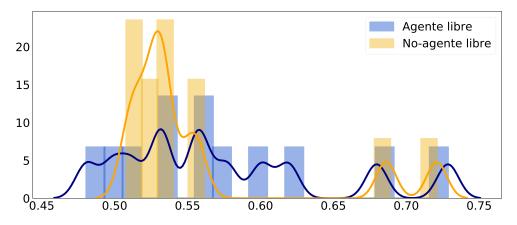




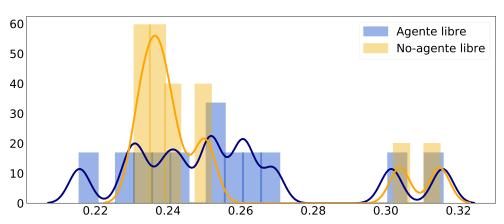
#### %Juegos iniciados



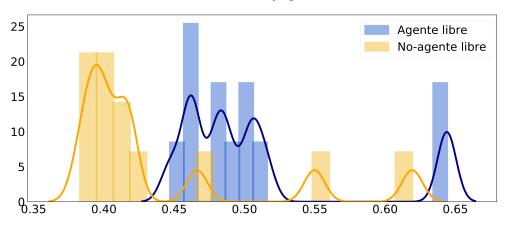
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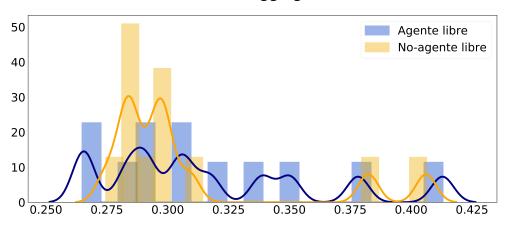
#### %Embasado



### **%Partidos jugados**

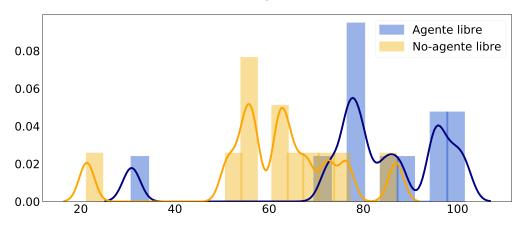


#### %Slugging

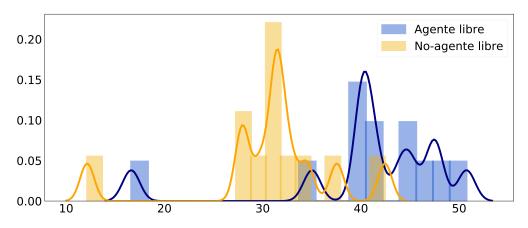


# A.2.4. Estadísticas deportivas promediadas anualmente - Filderos

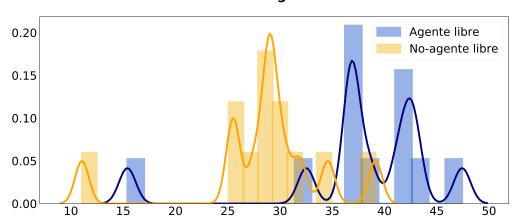
# **Bateos permitidos**



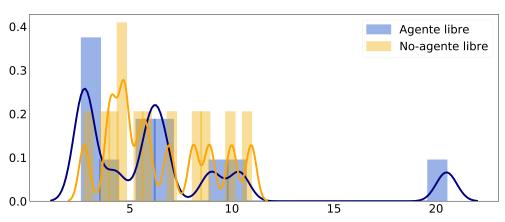
#### **Carreras permitidas**



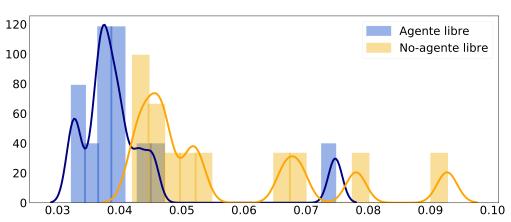
# **Carreras ganadas**



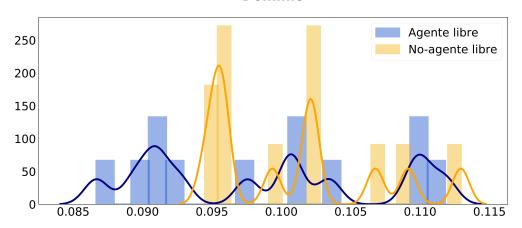




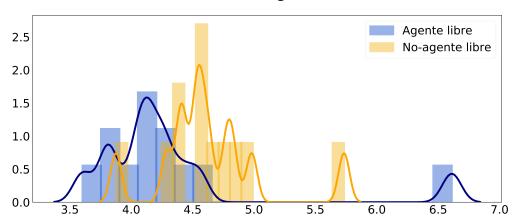
#### Control



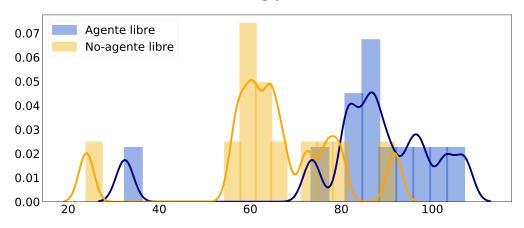
## **Dominio**



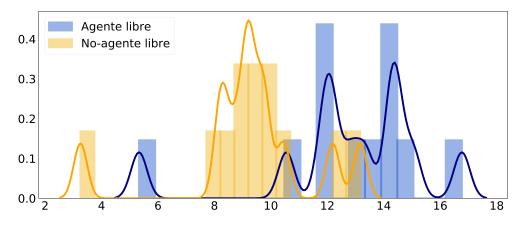
# %Carreras ganadas



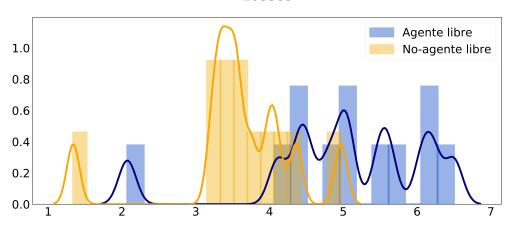
# **Inning pitched**



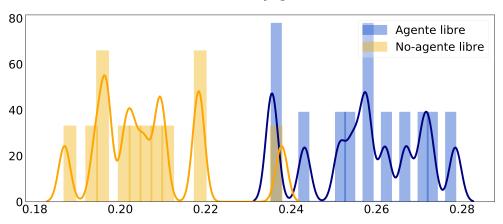
# Juegos iniciados



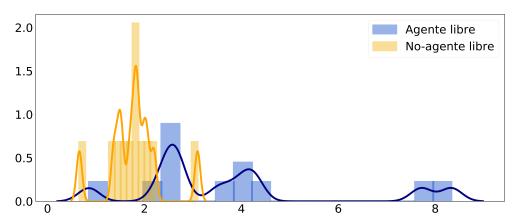
#### Losses



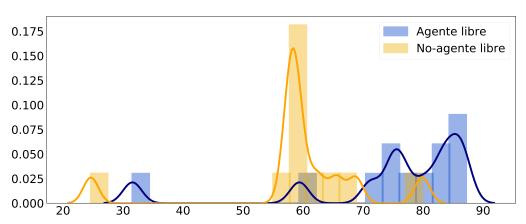
#### **Partidos jugados**



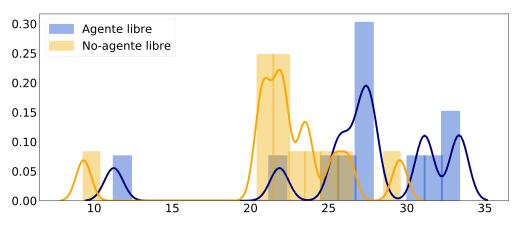
#### **Salvamentos**



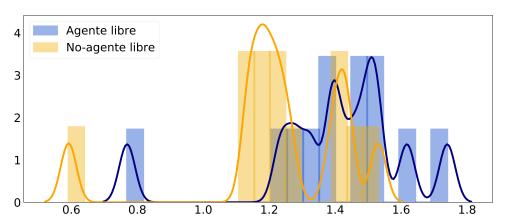
#### Strike-outs

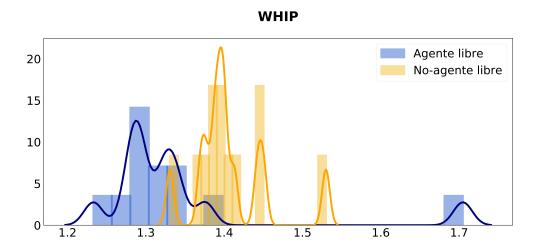


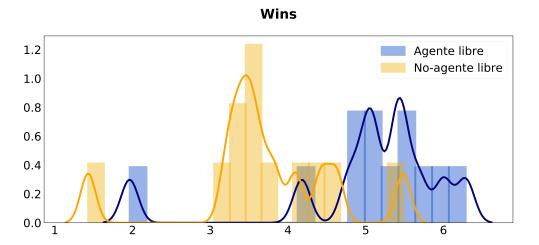
# Bases por bola permitidas



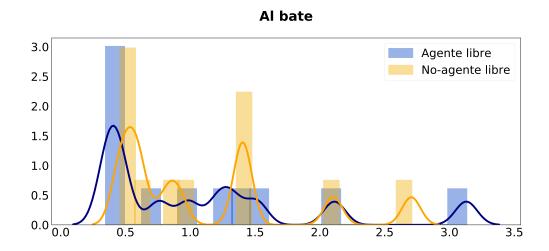
#### WAR



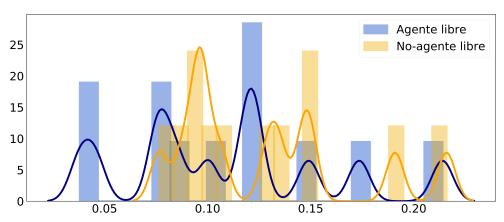




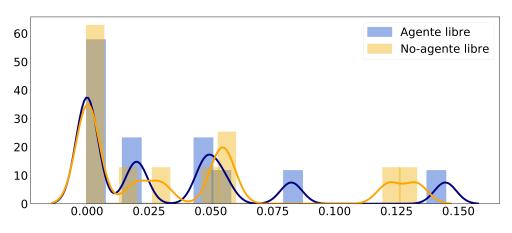
# A.2.5. Estadísticas deportivas por juego - Bateadores



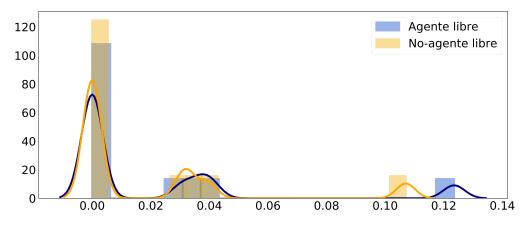
# **Bateos promedio**



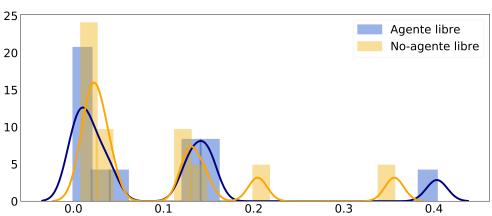
#### **Dobles**



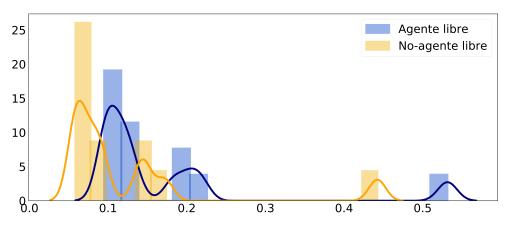
#### **Home-runs**



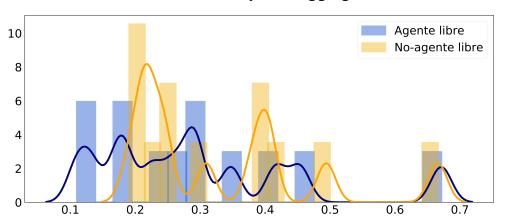
# **Carreras limpias**



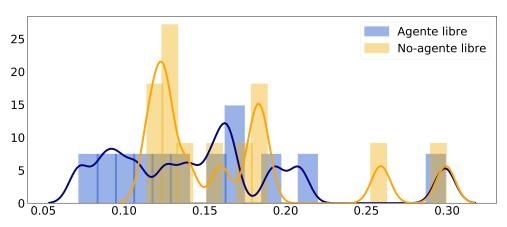
# %Juegos iniciados



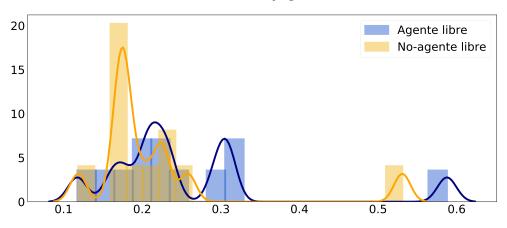
# **%On-base-plus-slugging**



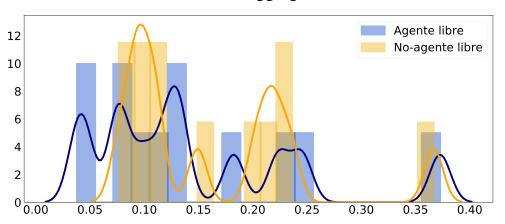
#### %Embasado



#### %Partidos jugados

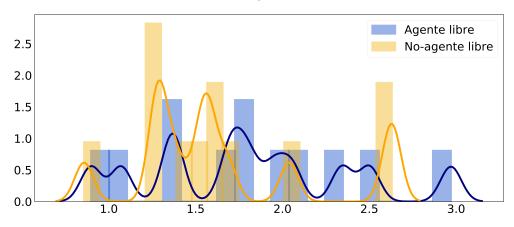


# %Slugging

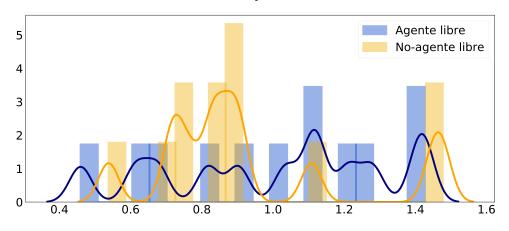


# A.2.6. Estadísticas deportivas por juego - Filderos

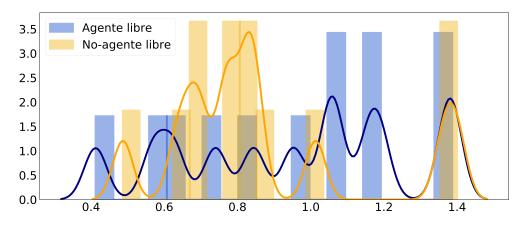
# **Bateos permitidos**

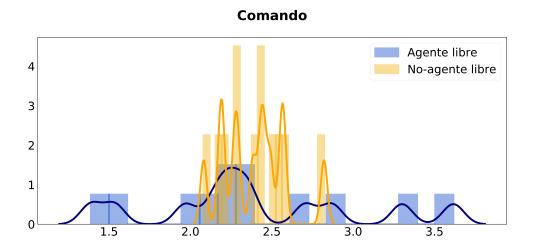


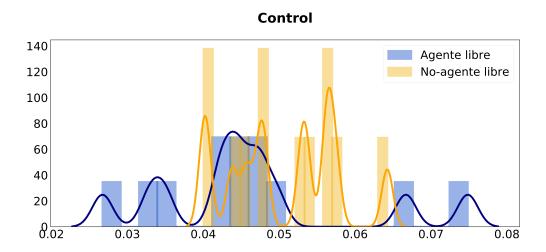
# **Carreras permitidas**

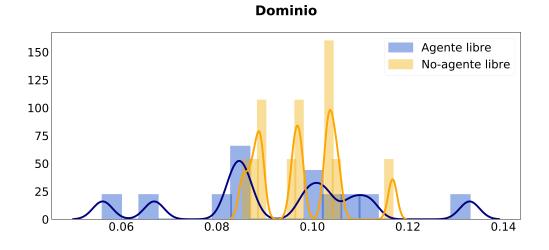


# **Carreras ganadas**

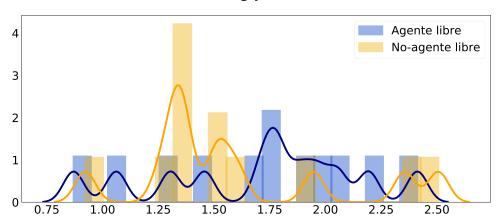




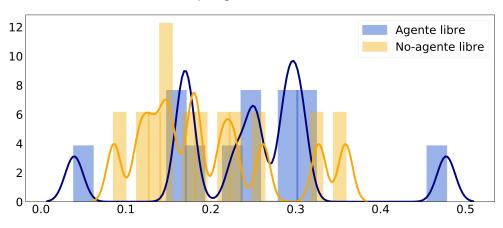




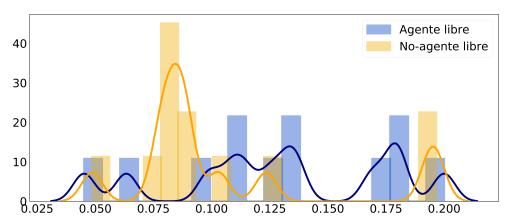
# Inning pitched



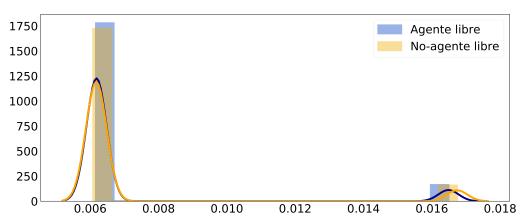
#### Juegos iniciados



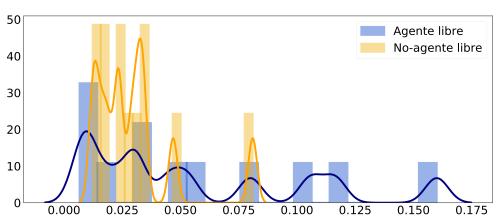
#### Losses



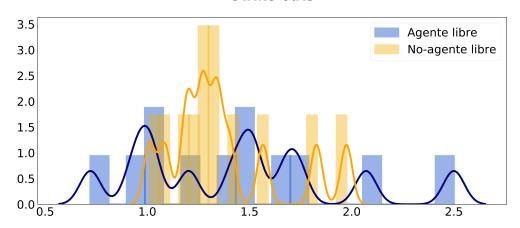
# **Partidos jugados**



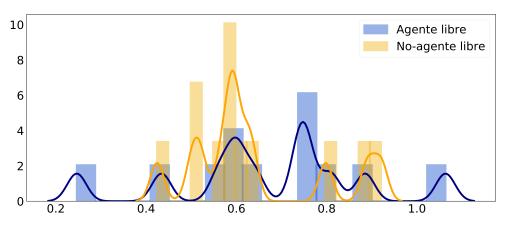
#### **Salvamentos**



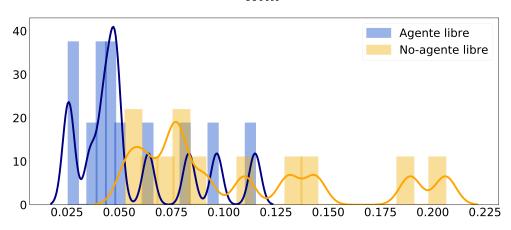
## Strike-outs



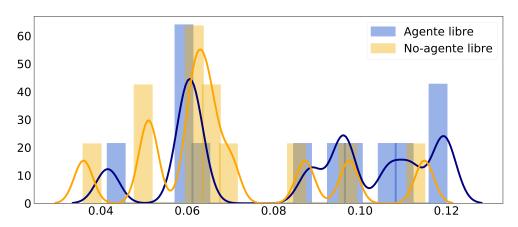
# Bases por bola permitidas



#### **WHIP**

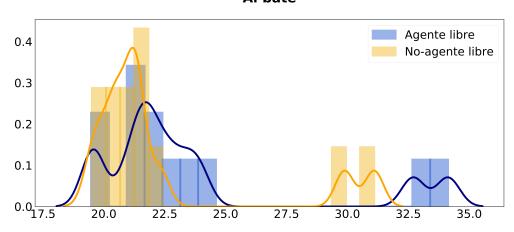


## Wins

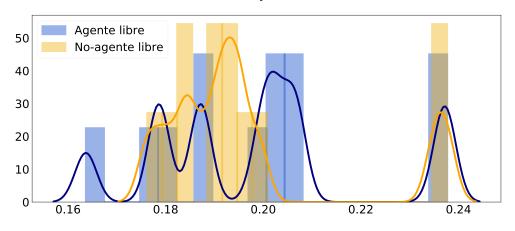


# A.2.7. Estadísticas deportivas por juego - Bateadores

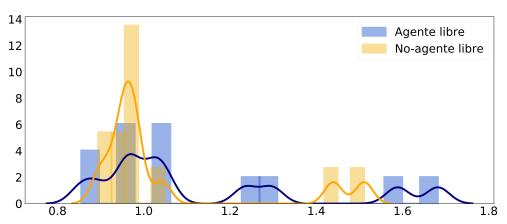




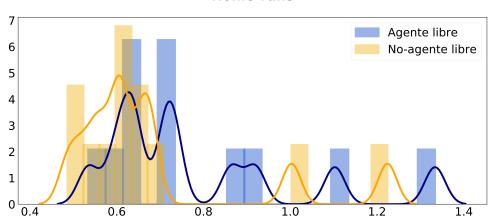
# **Bateos promedio**



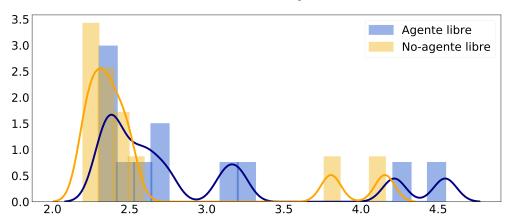
#### **Dobles**



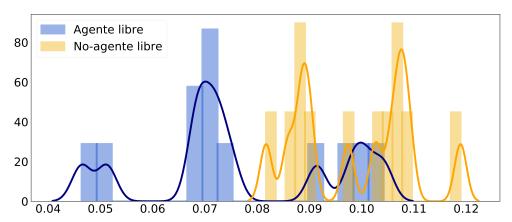
#### **Home-runs**



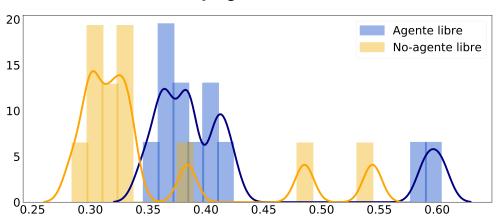
# **Carreras limpias**



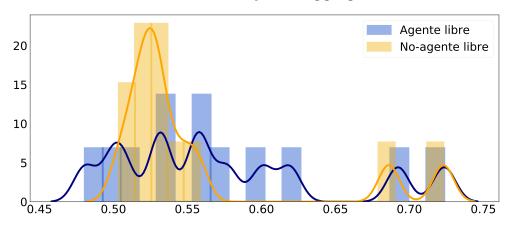
# **Triples**



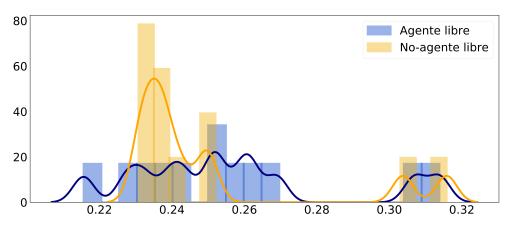
# %Juegos iniciados

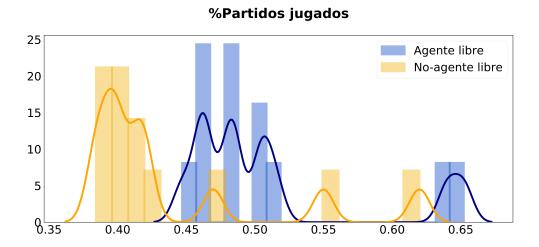


#### %On-base-plus-slugging

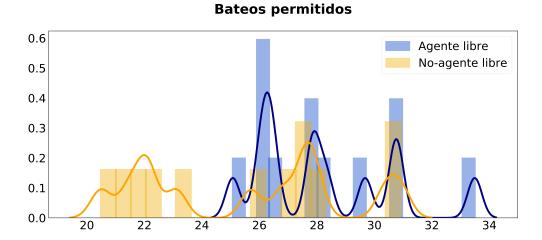


#### %Embasado

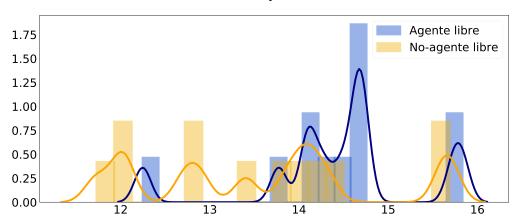




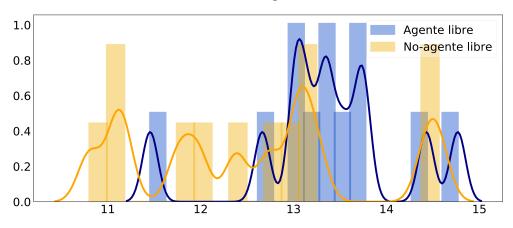
# A.2.8. Estadísticas deportivas por cada 10 juegos - Filderos



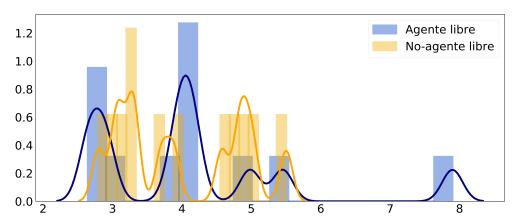
# **Carreras permitidas**

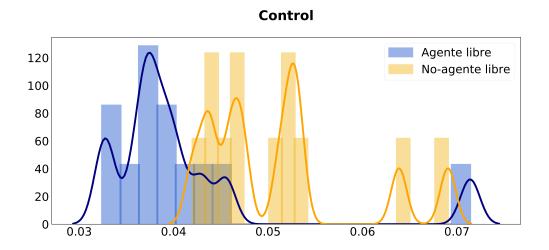


# **Carreras ganadas**

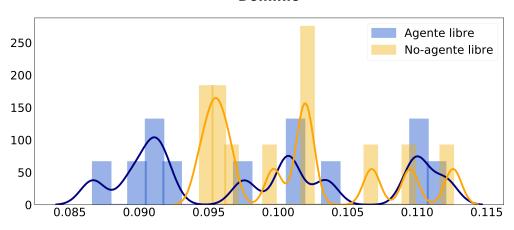


#### Comando

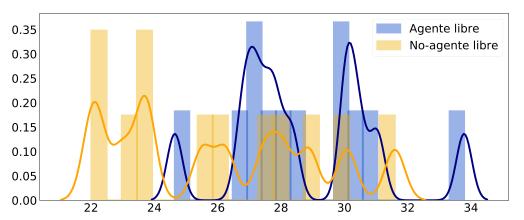




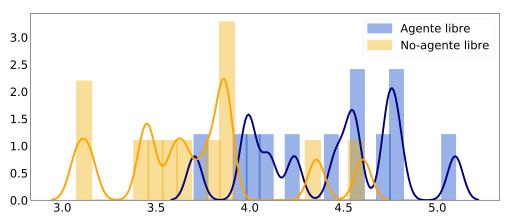
#### **Dominio**



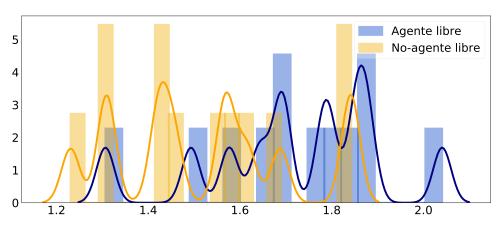
# **Inning pitched**



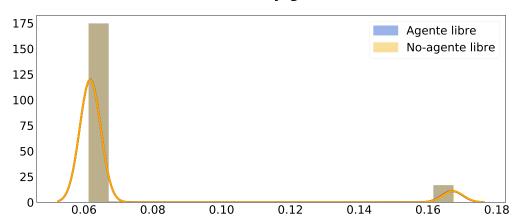
# Juegos iniciados



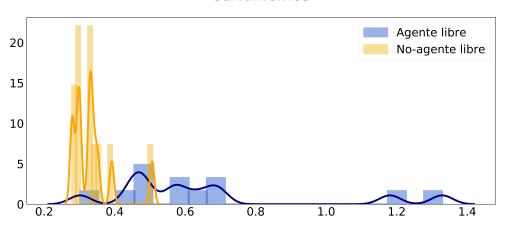
#### Losses



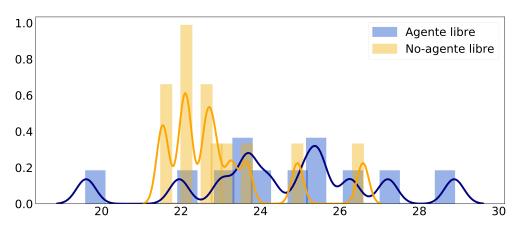
# **Partidos jugados**



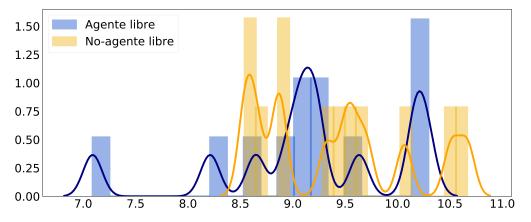
#### **Salvamentos**

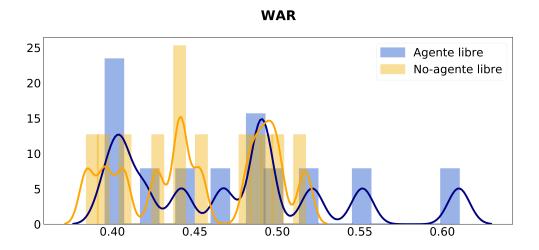


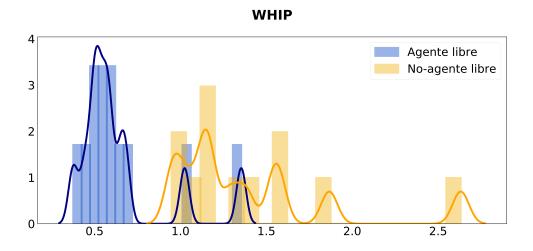
#### Strike-outs

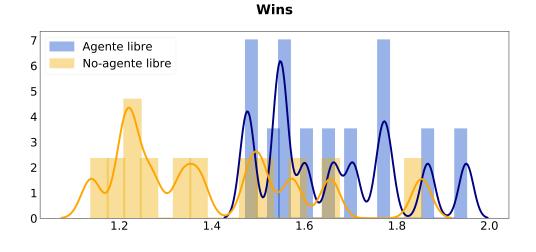


# Bases por bola permitidas



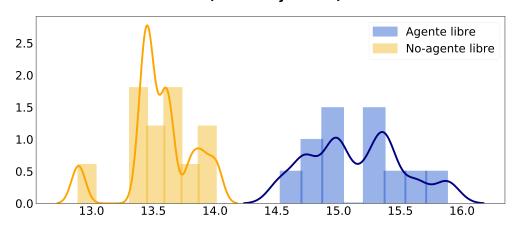




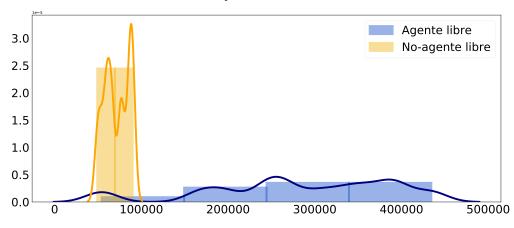


# A.2.9. Datos contactuales - Hitters

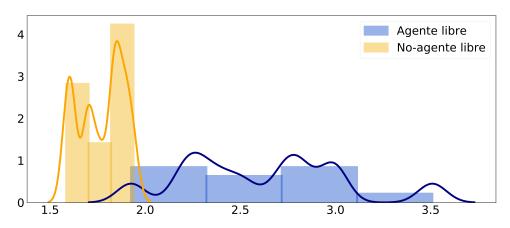
#### In(Sueldo ajustado)

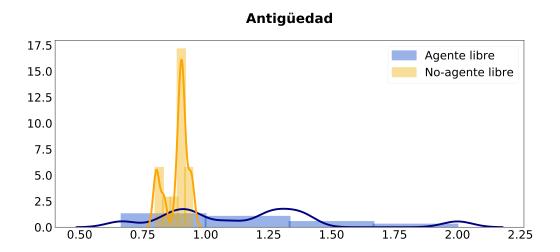


# Bono por firma[100k\$]



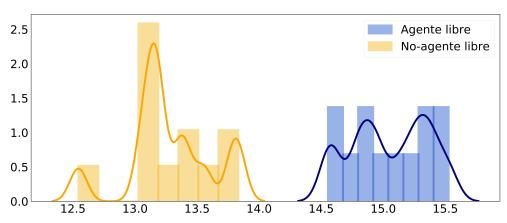
#### Años de contrato



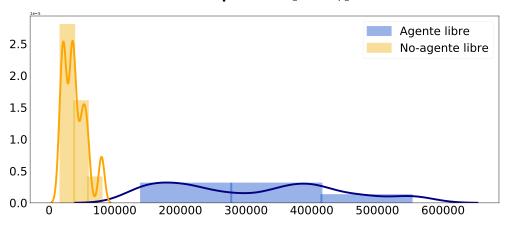


#### A.2.10. Datos contactuales - Fielders

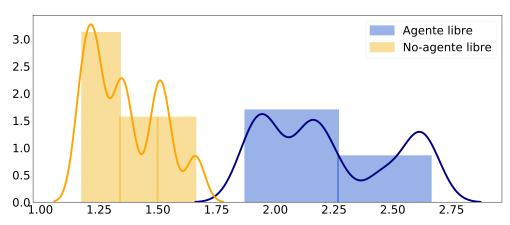
# In(Sueldo ajustado)



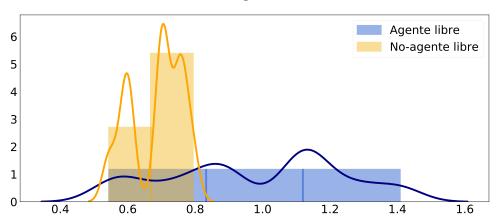
#### Bono por firma[100k\$]



#### Años de contrato

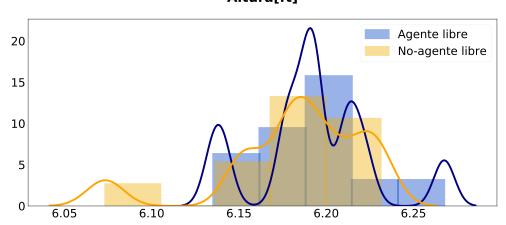


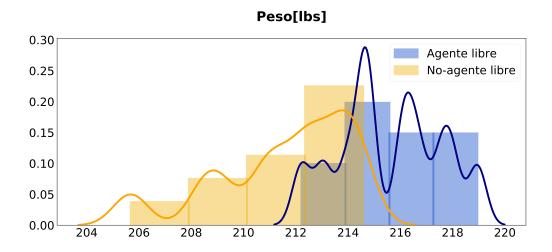
#### **Antigüedad**



# A.2.11. Datos generales - Bateadores

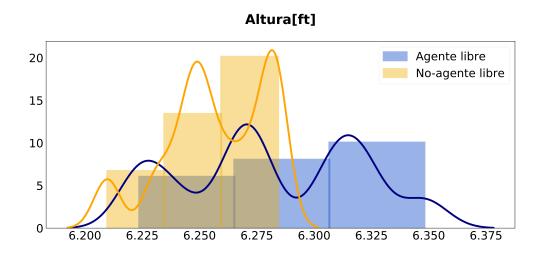
# Altura[ft]

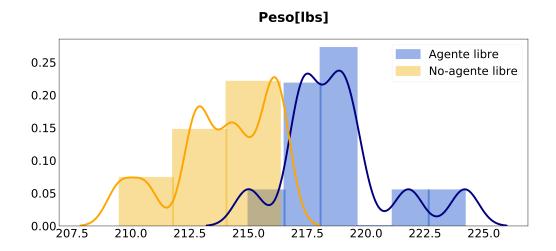


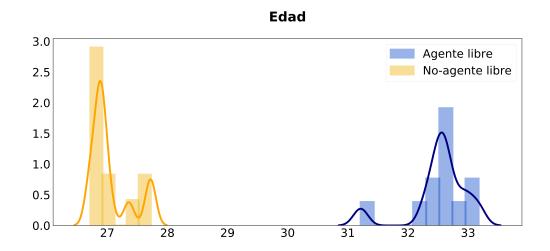


# 2.5 2.0 1.5 1.0 0.5 0.0 27 28 29 30 31 32 33

# A.2.12. Datos generales - Fielders



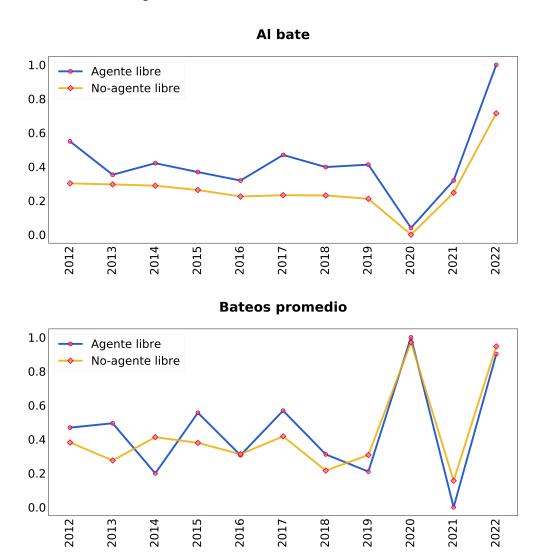




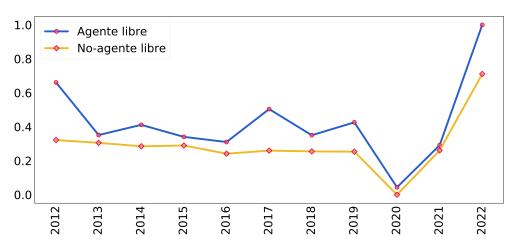
# A.3. Series de tiempo

En esta sección se muestran los promedios anuales de las mismas variables usadas en las dos secciones anteriores. Previo a obtener los promedios, se normalizaron los datos para restringir los valores al intervalo [0, 1], que abarca la base de datos.

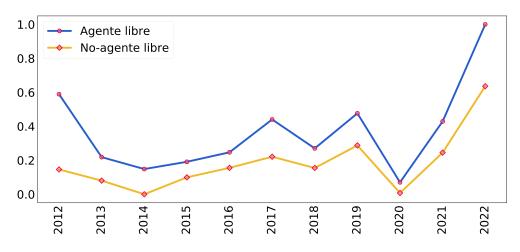
# A.3.1. Estadísticas deportivas acumuladas - Bateadores



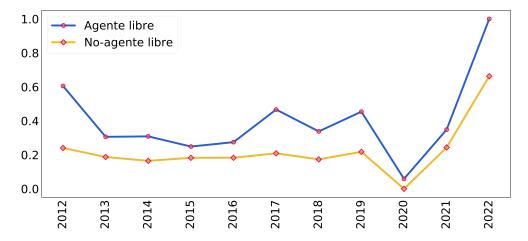


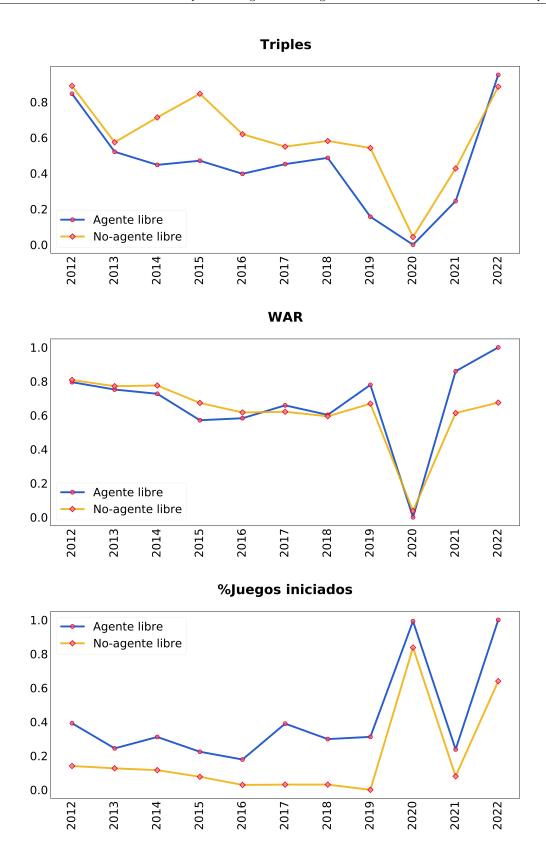


#### **Home-runs**

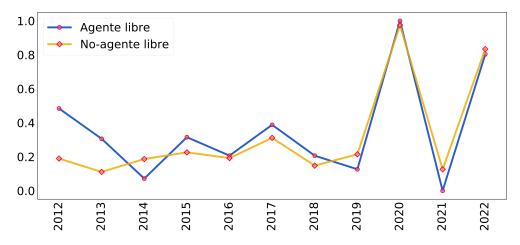


#### **Carreras limpias**

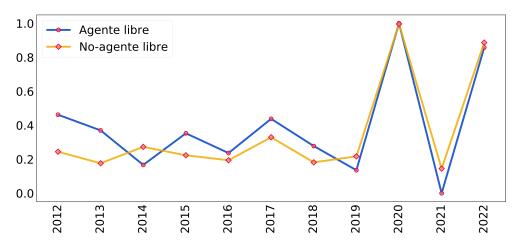




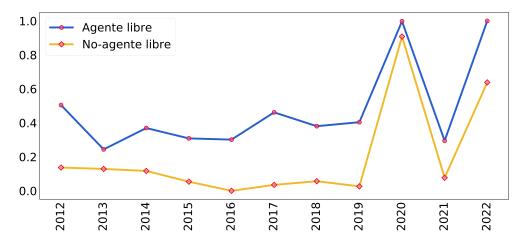
# %On-base-plus-slugging



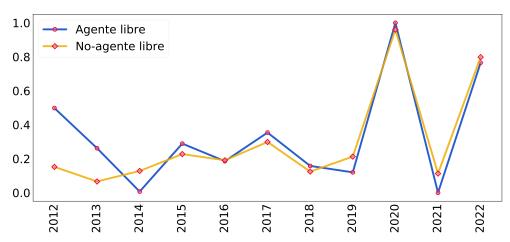
#### %Embasado



#### **%Partidos jugados**

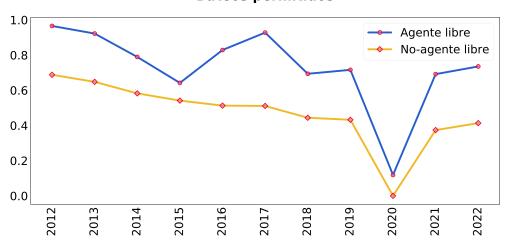


# %Slugging

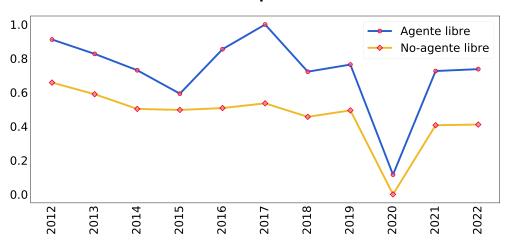


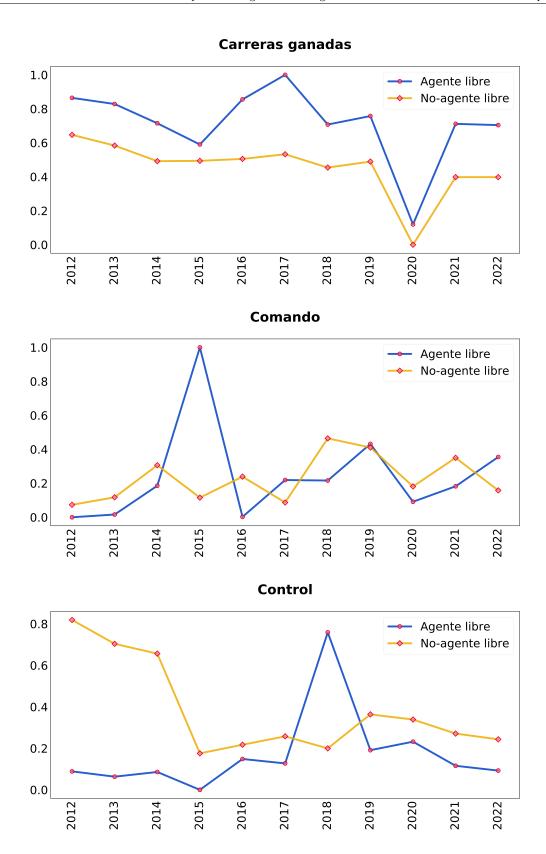
# A.3.2. Estadísticas deportivas acumuladas - Filderos

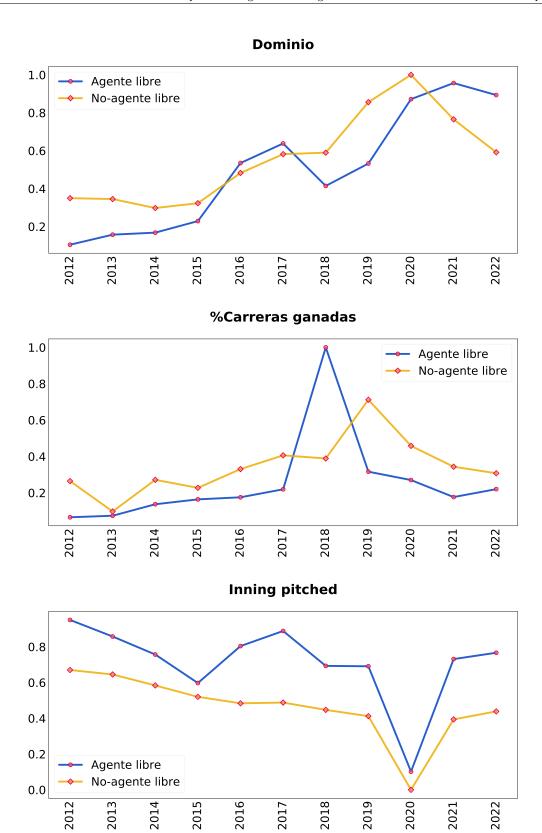
#### **Bateos permitidos**



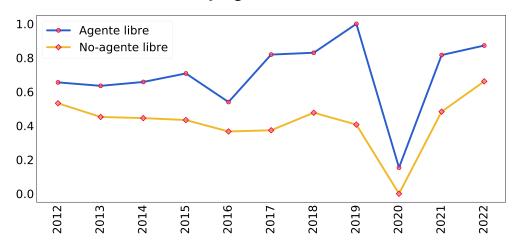
#### Carreras permitidas



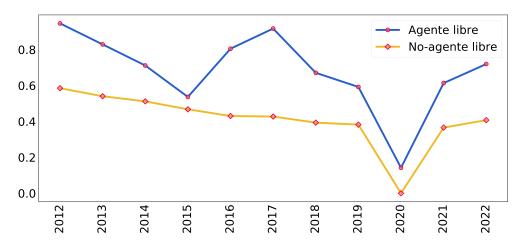




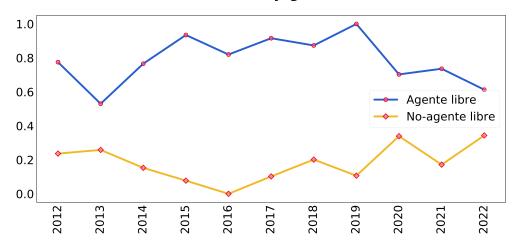




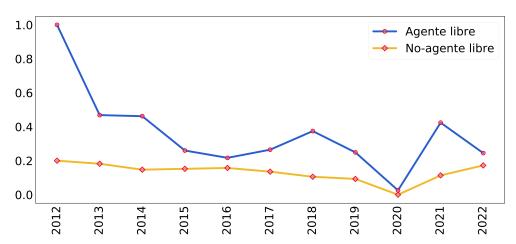
#### Losses



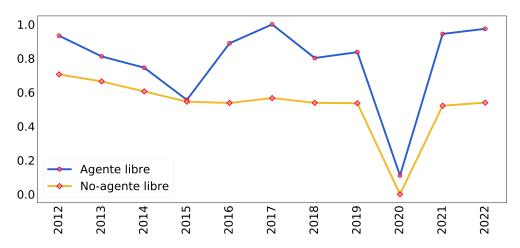
#### **Partidos jugados**



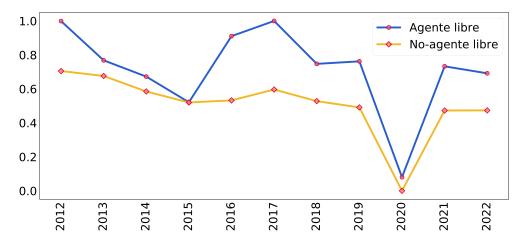


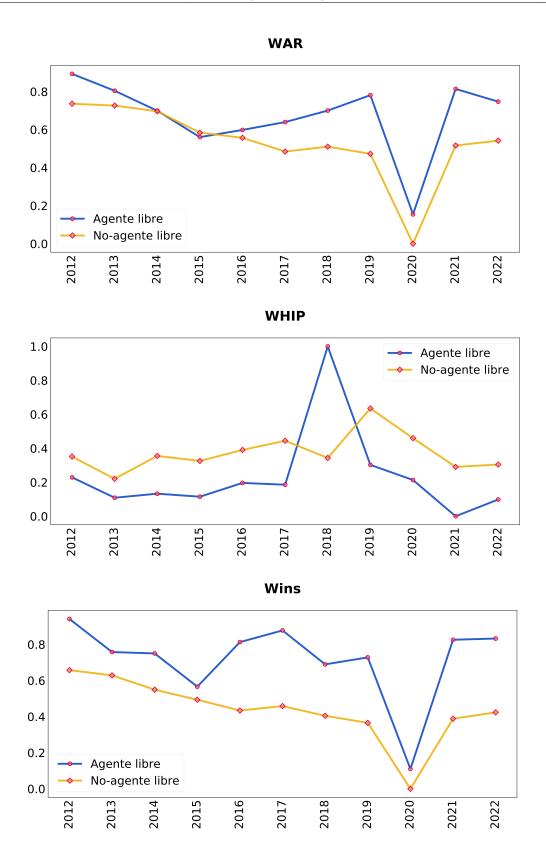


#### **Strike-outs**

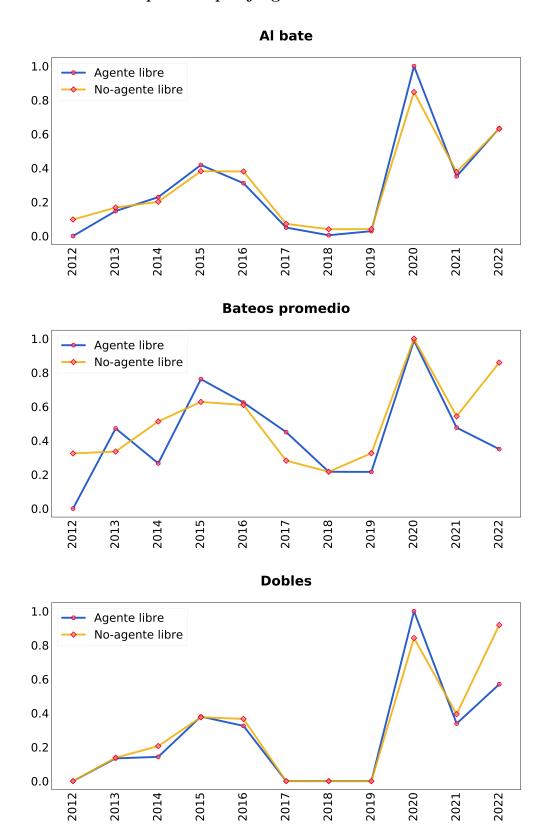


#### Bases por bola permitidas

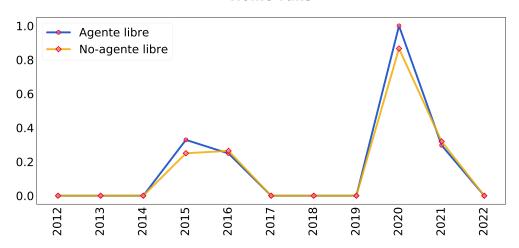




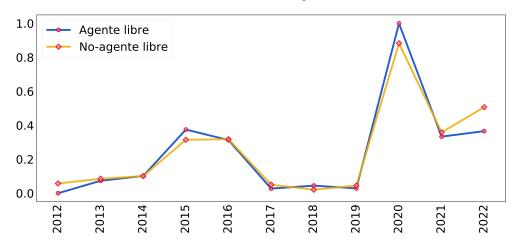
## A.3.3. Estadísticas deportivas por juego - Bateadores



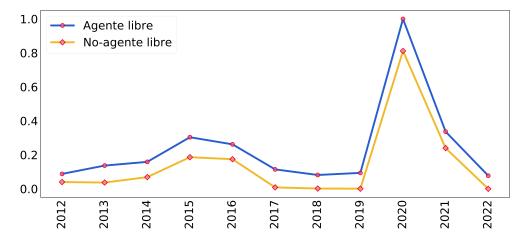
#### **Home-runs**



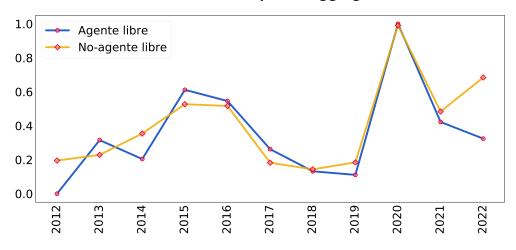
#### **Carreras limpias**



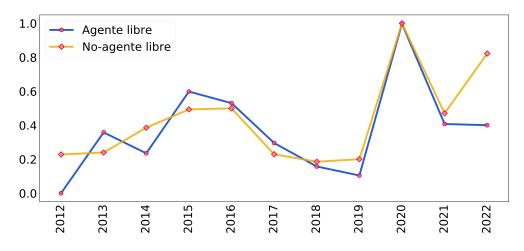
## %Juegos iniciados



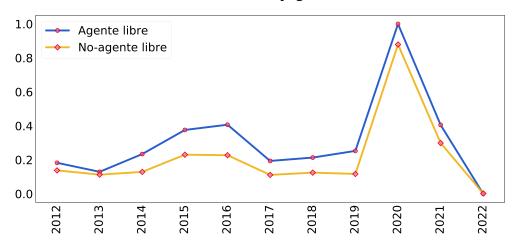
## %On-base-plus-slugging



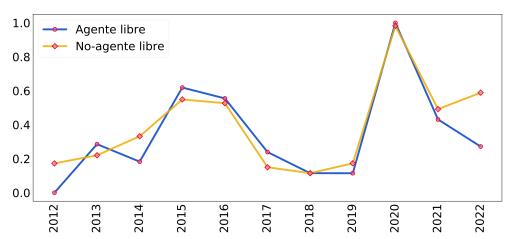
#### %Embasado



#### **%Partidos jugados**

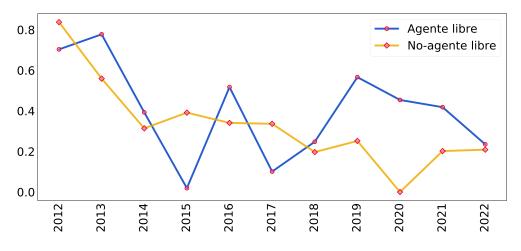


## %Slugging

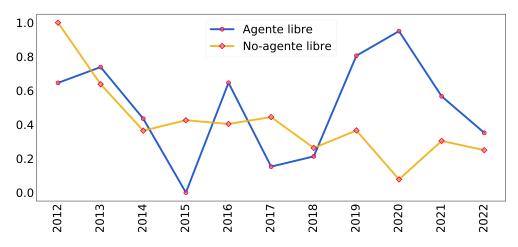


## A.3.4. Estadísticas deportivas por juego - Filderos

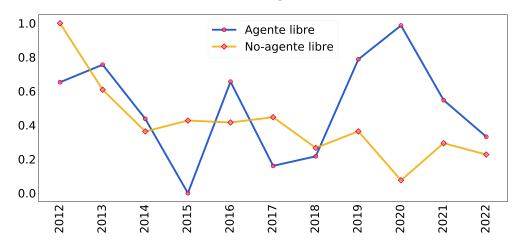


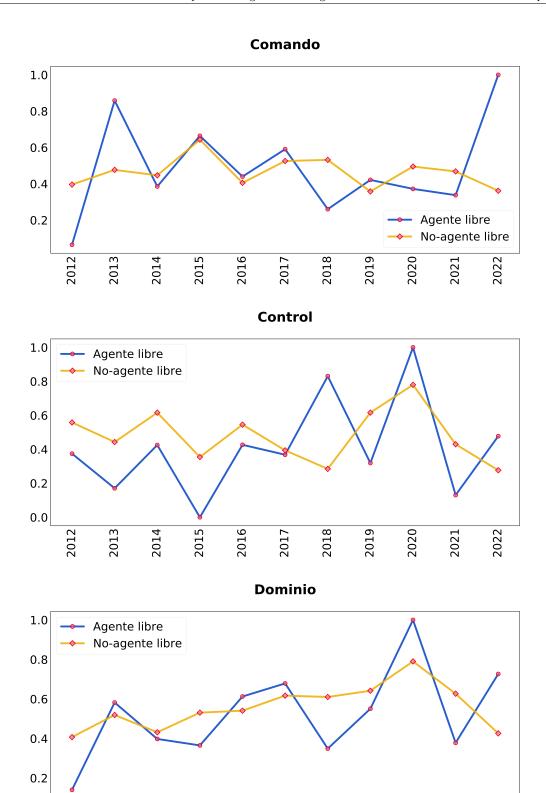


#### Carreras permitidas

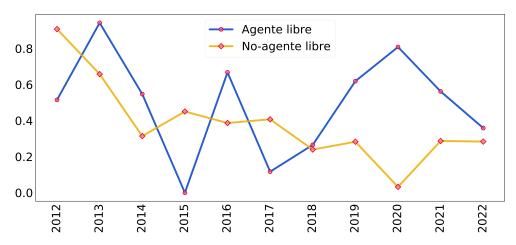


#### **Carreras ganadas**

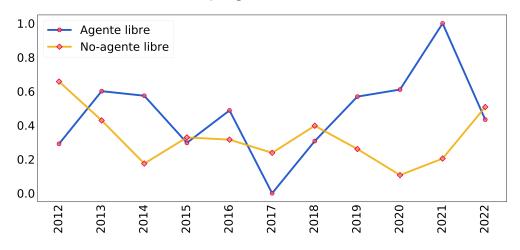




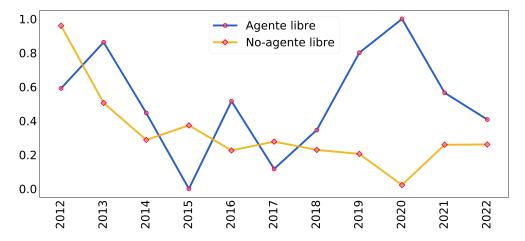
## **Inning pitched**



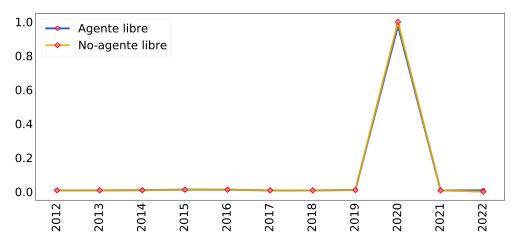
### Juegos iniciados



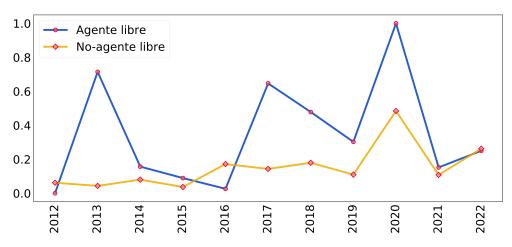
#### Losses



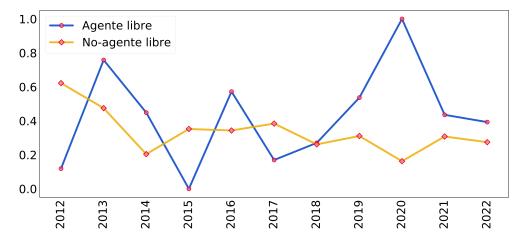
## **Partidos jugados**



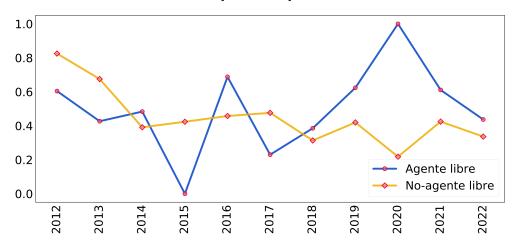
#### **Salvamentos**



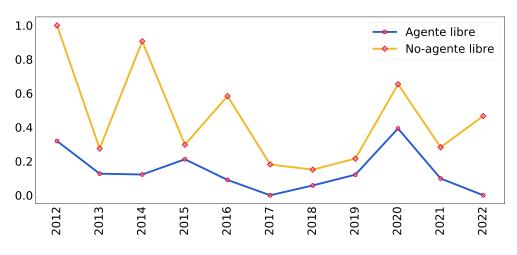
#### Strike-outs



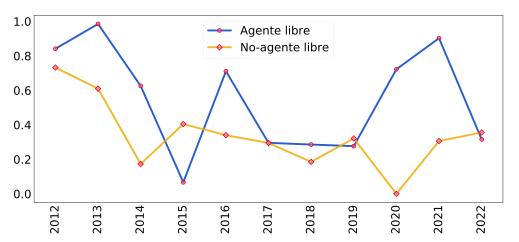
## Bases por bola permitidas



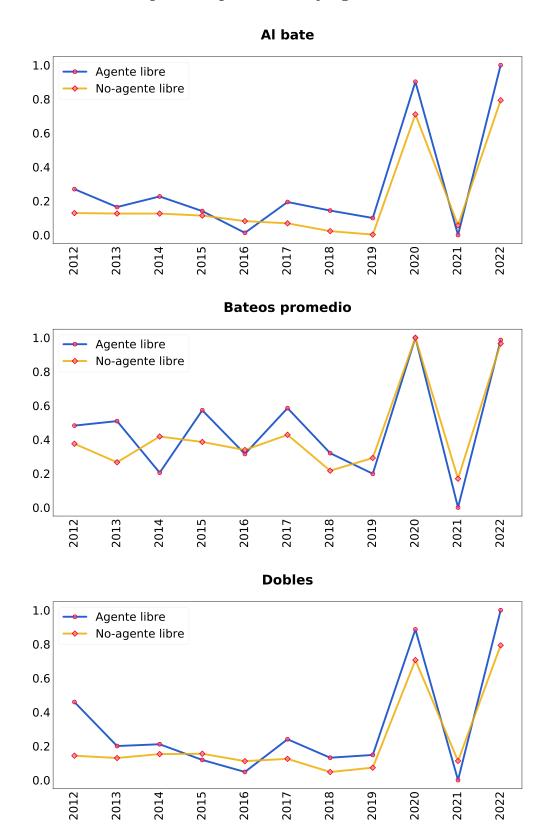
#### WHIP



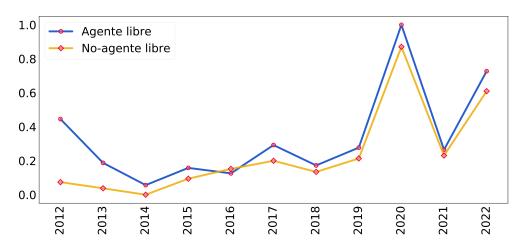
#### Wins



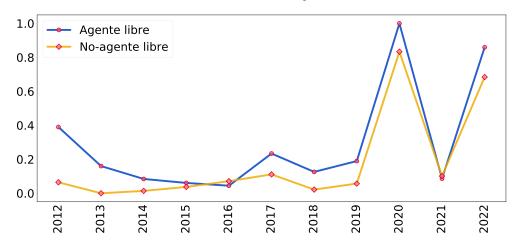
## A.3.5. Estadísticas deportivas por cada 10 juegos - Bateadores



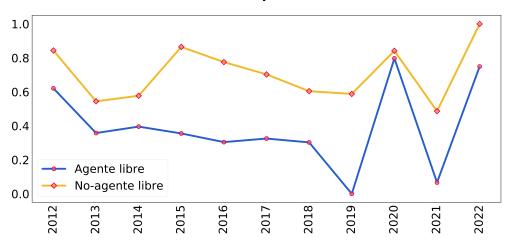
#### **Home-runs**



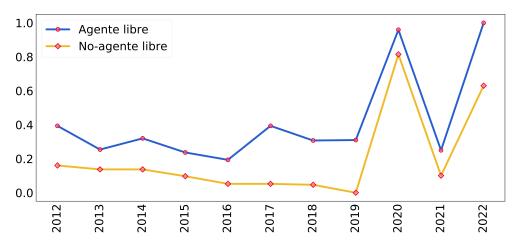
### **Carreras limpias**



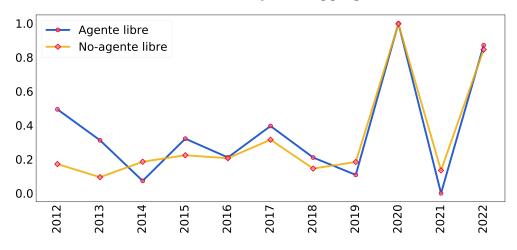
## **Triples**



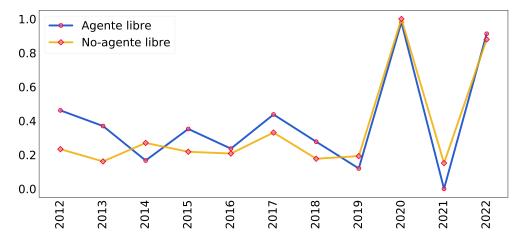
## %Juegos iniciados



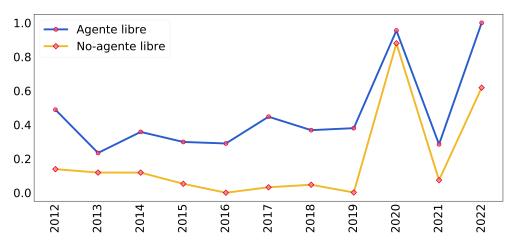
### %On-base-plus-slugging



#### %Embasado

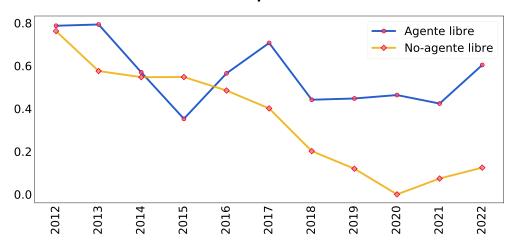


## %Partidos jugados

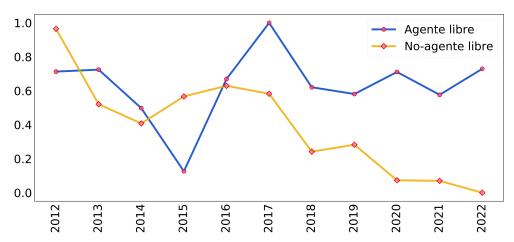


## A.3.6. Estadísticas deportivas por cada 10 juegos - Filderos

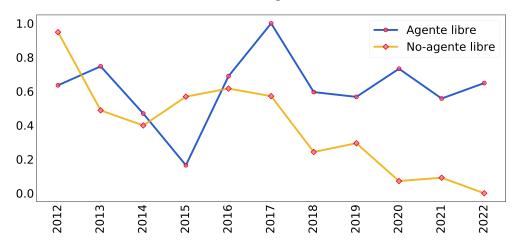
#### **Bateos permitidos**



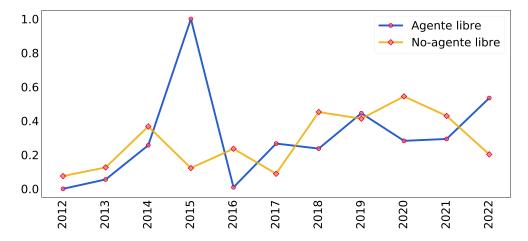


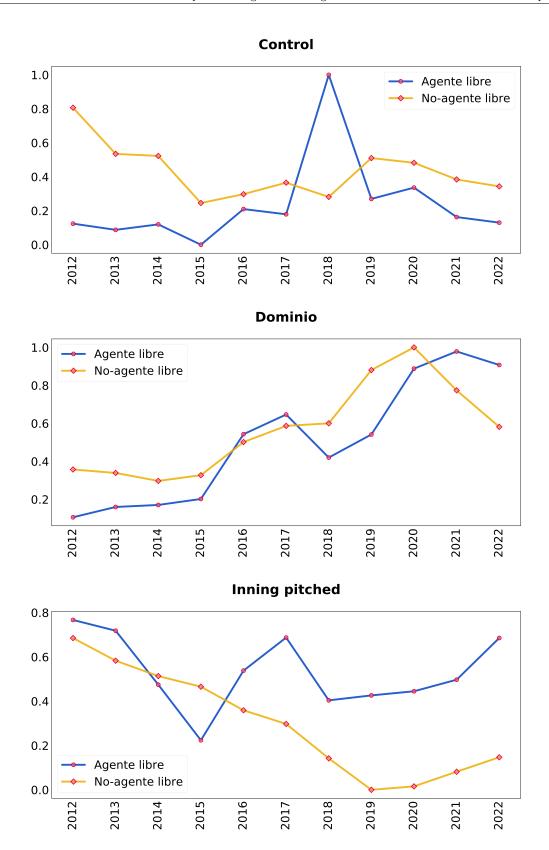


#### **Carreras ganadas**

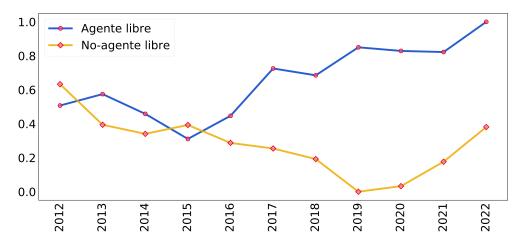


#### Comando

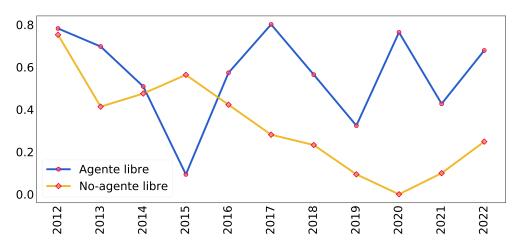




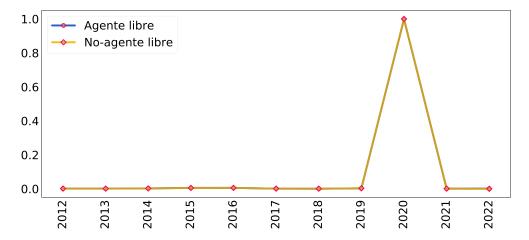
## Juegos iniciados



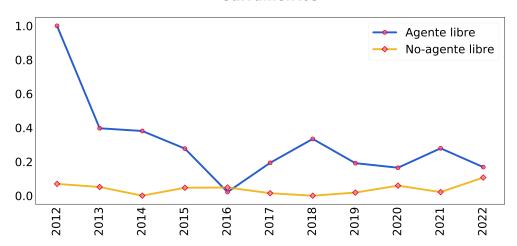
#### Losses



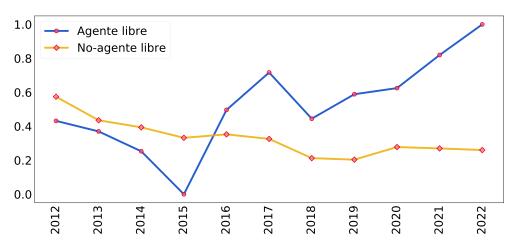
## **Partidos jugados**



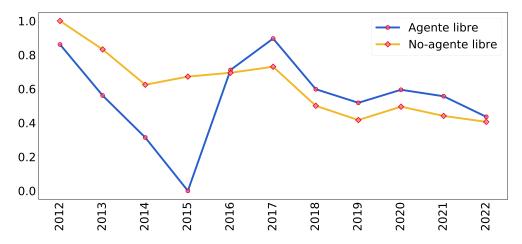
#### **Salvamentos**

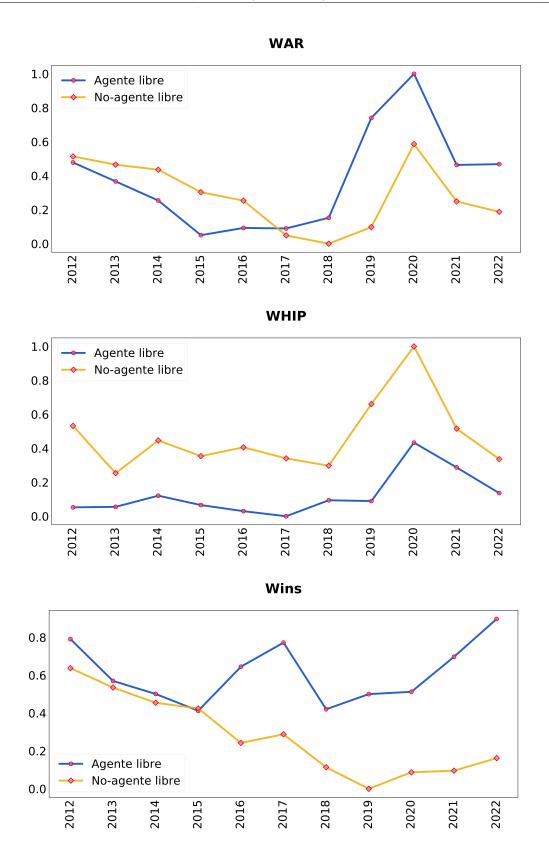


#### Strike-outs



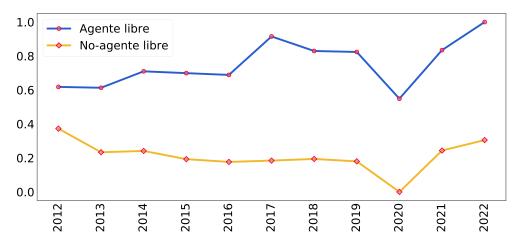
#### Bases por bola permitidas





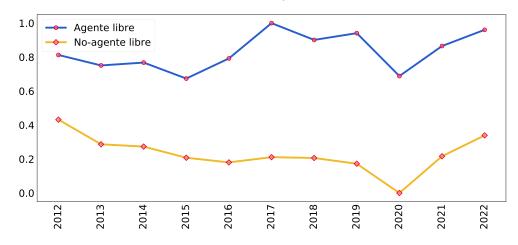
#### A.3.7. Salarios - Bateadores

## In(Sueldo ajustado)



#### A.3.8. Salarios - Fielders

#### In(Sueldo ajustado)



## B. Resultados de las regresiones

## C. Estimaciones directas

A continuación, se muestran las estimaciones directas e individuales con cada una de las estadísticas deportivas transformadas, X, para cuatro modelos o estimadores distintos: Pooling, within, Efectos aleatorios y primeras diferencias.

Cuadro 31: Bateadores: Modelo Pooling

	Dependent variable:						
	(1)	(2)	(3)	(4)	(5)	(6)	
$Edad_t$	-0.006** $(0.003)$	-0.006** $(0.003)$	-0.006** $(0.002)$	-0.006** $(0.003)$	-0.006** $(0.003)$	-0.006** $(0.003)$	
$\tilde{\text{Anos}} \text{ contrato}_t$	0.001 (0.004)	-0.001 $(0.004)$	0.001 (0.004)	-0.001 $(0.004)$	-0.0003 $(0.003)$	-0.001 $(0.003)$	
$\mathrm{Eqipo}_t$	0.001 (0.001)	0.001 (0.001)	0.001 $(0.001)$	0.001 (0.001)	0.001 $(0.001)$	0.001 $(0.001)$	
$X_{AB_t}$	-0.001 $(0.001)$	( )	( )	()	()	( )	
$X_{AB_{t-1}}$	-0.001 $(0.001)$						
$X_{AB_t^2}$	(0.00-)	-0.00002 $(0.00004)$					
$X_{AB_{t-1}^2}$		-0.00000 $(0.00003)$					
$X_{H_t}$		(0.0000)	$-0.002^*$ (0.001)				
$X_{H_{t-1}}$			0.0003 $(0.001)$				
$X_{H_t^2}$			(0.001)	-0.0001 $(0.0001)$			
$X_{H^2_{t-1}}$				0.0001 (0.0001)			
$X_{BA_t}$				(0.0001)	-0.031 $(0.020)$		
$X_{BA_{t-1}}$					0.020 $(0.017)$		
$X_{BA_t^2}$					(0.011)	-0.046 $(0.029)$	
$X_{BA_{t-1}^2}$						0.005	
Intercepto	0.162* (0.085)	0.157* (0.081)	0.149* (0.081)	0.153* (0.086)	0.152* (0.085)	(0.017) $0.149*$ $(0.085)$	

*Note:* \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

	Dependent variable:						
	(1)	(2)	(3)	(4)	(5)	(6)	
$Edad_t$	-0.006** (0.002)	-0.006** (0.003)	-0.006** (0.003)	-0.006** (0.003)	-0.006** (0.003)	-0.006** (0.003)	
$\tilde{\text{Anos}}$ contrato <sub>t</sub>	0.001 $(0.004)$	-0.001 $(0.004)$	-0.002 $(0.003)$	-0.001 $(0.003)$	0.001 (0.004)	-0.001 $(0.004)$	
$\mathrm{Eqipo}_t$	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 $(0.001)$	
$X_{D_t}$	-0.004 $(0.003)$						
$X_{D_{t-1}}$	-0.001 $(0.003)$						
$X_{D_t^2}$		-0.0004 $(0.001)$					
$X_{D_{t-1}^2}$		0.001 $(0.001)$					
$X_{HR_t}$			-0.001 $(0.004)$				
$X_{HR_{t-1}}$			0.003 $(0.002)$				
$X_{HR_t^2}$				-0.001 $(0.001)$			
$X_{HR_{t-1}^2}$				-0.0001 $(0.0004)$			
$X_{GS_t}$					-0.002 $(0.001)$		
$X_{GS_{t-1}}$					-0.001 $(0.001)$	0.0001	
$X_{GS_t^2}$						-0.0001 $(0.0002)$	
$X_{GS_{t-1}^2}$	0.150*	0.1554	0.1504	0.100*	0.101*	0.00005 $(0.0001)$	
Intercepto	0.150* (0.080)	0.155* (0.083)	0.158* (0.083)	0.160* (0.083)	0.161* (0.084)	0.158* (0.081)	

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

	Dependent variable:						
	(1)	(2)	(3)	(4)	(5)	(6)	
$Edad_t$	-0.006** $(0.003)$	-0.005** $(0.003)$	-0.006** $(0.003)$	-0.005** $(0.003)$	-0.006** (0.003)	-0.006** (0.003)	
$\tilde{\text{Anos}}$ contrato <sub>t</sub>	-0.0004 $(0.003)$	0.0001 (0.004)	-0.001 $(0.003)$	-0.0002 $(0.003)$	0.0002 $(0.003)$	0.0002 $(0.004)$	
$\mathrm{Eqipo}_t$	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	
$X_{OPS_t}$	-0.021 $(0.014)$	()	()	()	( )	()	
$X_{OPS_{t-1}}$	-0.001 $(0.013)$						
$X_{OPS_t^2}$	(0.019)	$-0.026^{**}$ (0.013)					
$X_{OPS_{t-1}^2}$		0.008					
$X_{OBP_t}$		(0.011)	-0.043**				
$X_{OBP_{t-1}}$			(0.022) $0.020$				
$X_{OBP_t^2}$			(0.019)	$-0.049^*$			
$X_{OBP_{t-1}^2}$				(0.028) $0.006$			
$X_{SLG_t}$				(0.020)	-0.018		
$X_{SLG_{t-1}}$					(0.019) $-0.023$		
$X_{SLG_t^2}$					(0.017)	$-0.040^*$	
$X_{SLG_{t-1}^2}$						(0.022) $0.014$	
Intercepto	0.160* (0.085)	0.142* (0.086)	0.156* (0.083)	0.144* (0.083)	0.167** (0.082)	$(0.018)$ $0.148^*$ $(0.085)$	

Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

# Referencias