Regresión Avanzada Proyecto Final

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Resumen

Agregar un resumen al final.

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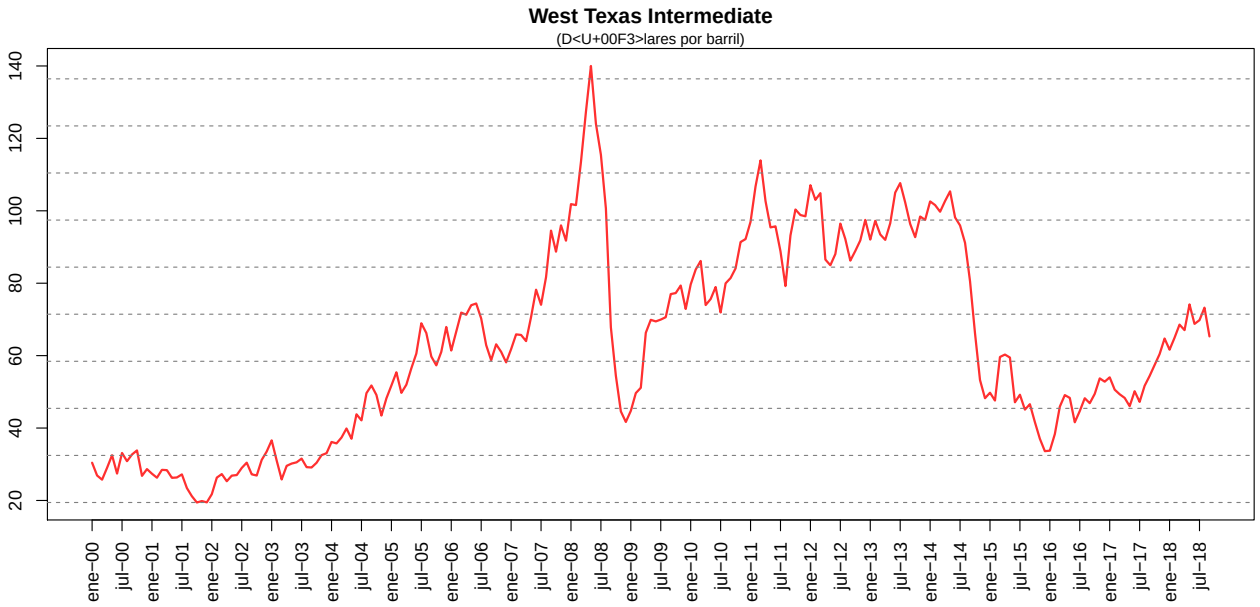

Figura 1: Serie de Tiempo del precio del West Texas Intermediate

2. Datos

2.1. Descripción de los datos

Tabla 1: Resumen de los Datos

Código	Variable	Unidades	Fuente	Ticker
WTI	West Texas Intermediate	Dólares por barril	Bloomberg	CL1 Comdty
JPM Dollar Index	JPM Dollar Index	Unidades	Bloomberg	FXJPEMCI Index
VIX	Chicago Board Options Exchange SPX Volatility Index	Unidades	Bloomberg	VIX Index
Prod. OPEP	Producción Total de Petróleo de la OPEP	Millones de barriles por día	Bloomberg	OPCRTOTL Index
Dem. OPEP	Demanda Total de Petróleo de la OPEP	Millones de barriles por dia	Bloomberg	OPCBRTOT Index
TBILL-10YR	Tasa de Largo Plazo de Estados Unidos	Porciento	FRED	DGS10
TBILL-1YR	Tasa de Corto Plazo de Estados Unidos	Porciento	FRED	DGS1

Se tienen observaciones mensuales del West Texas Intermediate (WTI), del JPM Dollar Index, del Chicago Board Options Exchange SPX Volatility Index, de la producción y demanda de petróleo por parte de la OPEP, así como las tasas de corto y largo plazo en Estados Unidos. La tabla 1 resume las fuentes de información de los datos a utilizar en este trabajo. La muestra contiene 225 observaciones que corresponden al periodo de enero del 2000 a septiembre del 2018. Para estimar los modelos se utiliza el periodo comprendido entre enero del 2000 y junio del 2018; mientras que el horizonte de pronóstico va de julio del 2018 a septiembre del 2018. La siguiente sección muestra una análisis exploratorio de los datos.

2.2. Análisis exploratorio de los datos

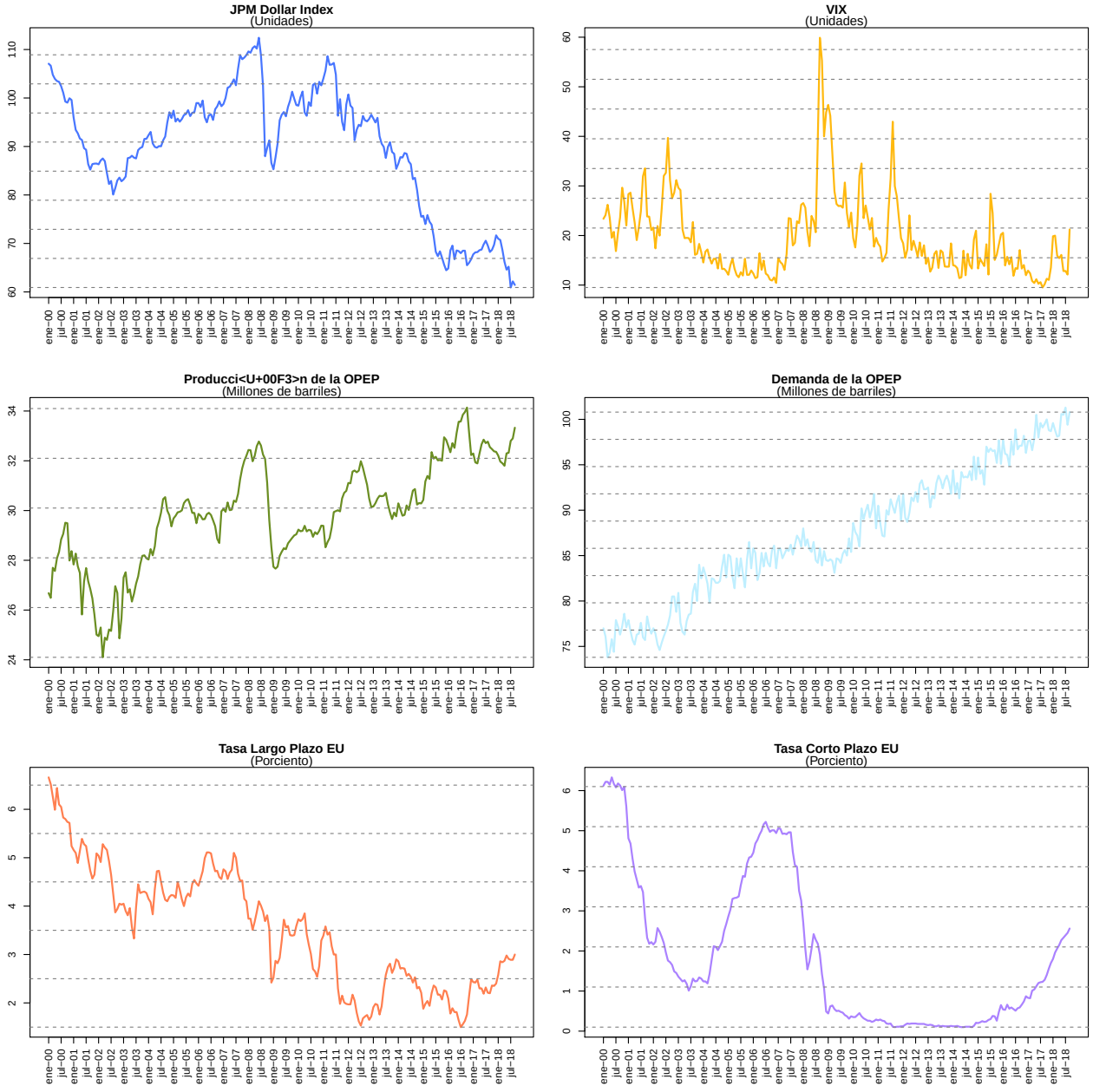

Figura 2: Serie de Tiempo de los Regresores

Tabla 2: Matriz de correlaciones de las variables de estudio

	WTI	JPM Dollar Ind.	VIX	Prod. OPEP	Dem. OPEP	TBILL-10YR	TBILL-1YR
WTI	1.00	0.38	-0.14	0.46	0.44	-0.42	-0.35
JPM Dollar Ind.	0.38	1.00	0.19	-0.34	-0.56	0.50	0.34
VIX	-0.14	0.19	1.00	-0.34	-0.37	0.16	-0.04
Prod. OPEP	0.46	-0.34	-0.34	1.00	0.82	-0.62	-0.23
Dem. OPEP	0.44	-0.56	-0.37	0.82	1.00	-0.84	-0.56
TBILL-10YR	-0.42	0.50	0.16	-0.62	-0.84	1.00	0.84
TBILL-1YR	-0.35	0.34	-0.04	-0.23	-0.56	0.84	1.00

Tabla 3: Estad<U+00ED>sticas Descriptivas de las Variables de Estudio

	WTI	JPM Dollar Ind.	VIX	Prod. OPEP	Dem. OPEP	TBILL-10YR	TBILL-1YR
Mediana	60.57	92.05	17.47	29.95	86.20	3.56	1.24
Media	62.69	89.76	19.67	29.87	87.41	3.51	1.86
Moda	101.58	107.07	13.29	28.08	84.70	2.30	0.12
Varianza	726.88	163.02	64.80	4.38	52.46	1.53	3.40
Desv.Est.	26.96	12.77	8.05	2.09	7.24	1.24	1.84
Coef. Var.	0.43	0.14	0.41	0.07	0.08	0.35	0.99
Min	19.44	60.91	9.51	24.10	73.80	1.50	0.10
Max	140.00	112.43	59.89	34.14	101.30	6.66	6.33
Rango	120.56	51.52	50.38	10.04	27.50	5.16	6.23

3. MRLMN

PENDIENTE....

4. GLM Estático

Tabla 4: Coeficientes Estimados para el Modelo Est<U+00E1>tico

	Media	Mediana	Moda	2.5 %	97.5 %	Prob.
Intercepto	-183.08	-183.36	-199.75	-230.61	-133.62	0.00
JPM Dollar Ind.	1.84	1.84	1.76	1.67	2.00	0.00
VIX Ind	-0.29	-0.29	-0.07	-0.52	-0.06	0.01
Prod. OPEP	0.52	0.53	1.98	-1.15	2.18	0.27
Dem. OPEP	1.26	1.26	0.97	0.64	1.86	0.00
T-Bill 10YR	-10.75	-10.74	-10.43	-14.74	-6.92	0.00
T-Bill 1YR	-0.83	-0.84	-1.00	-2.90	1.29	0.22

```
## [1] "DIC=1807.16039384582"
```

5. GLM Dinámico

```
## [1] 21501.05
```

```
## [[1]]
## [[1]]$rect
## [[1]]$rect$w
## [1] 60.48327
##
```

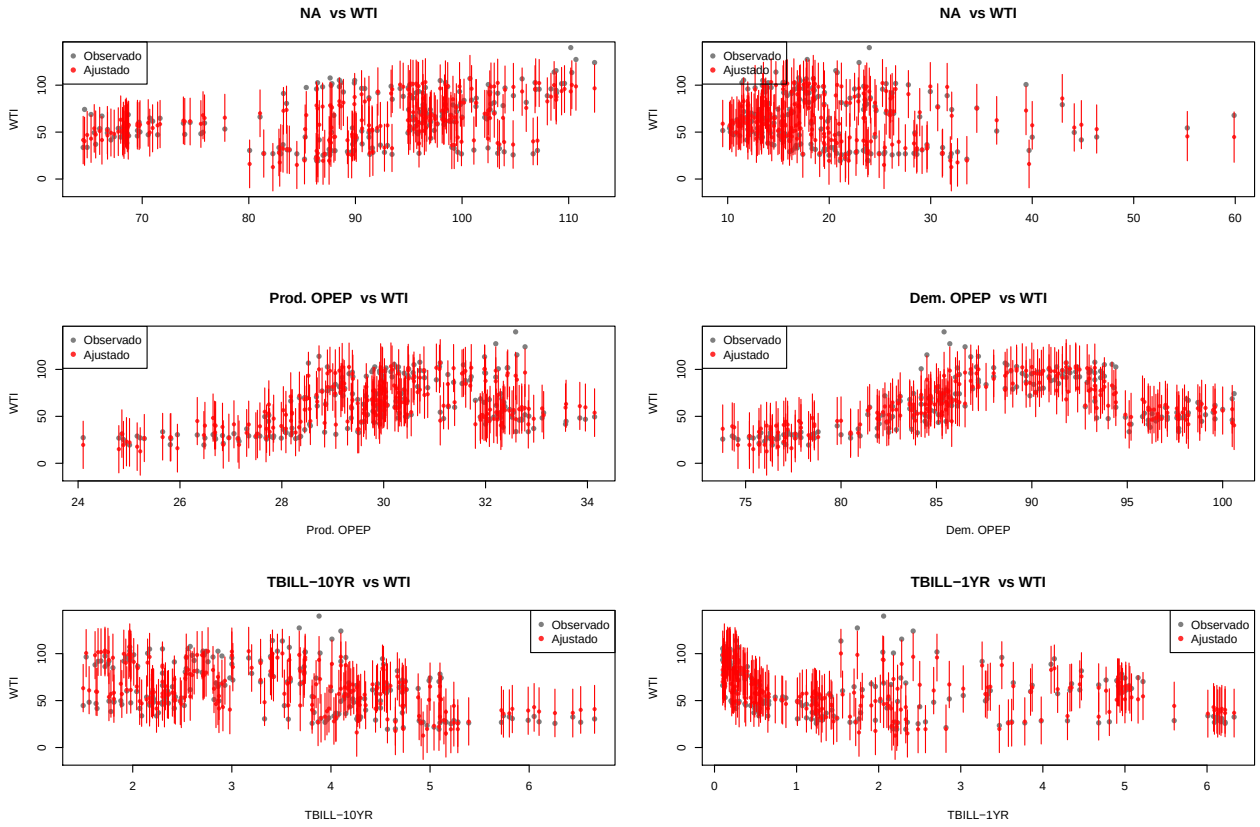

Figura 3: Regresores vs WTI: Modelo Esttico

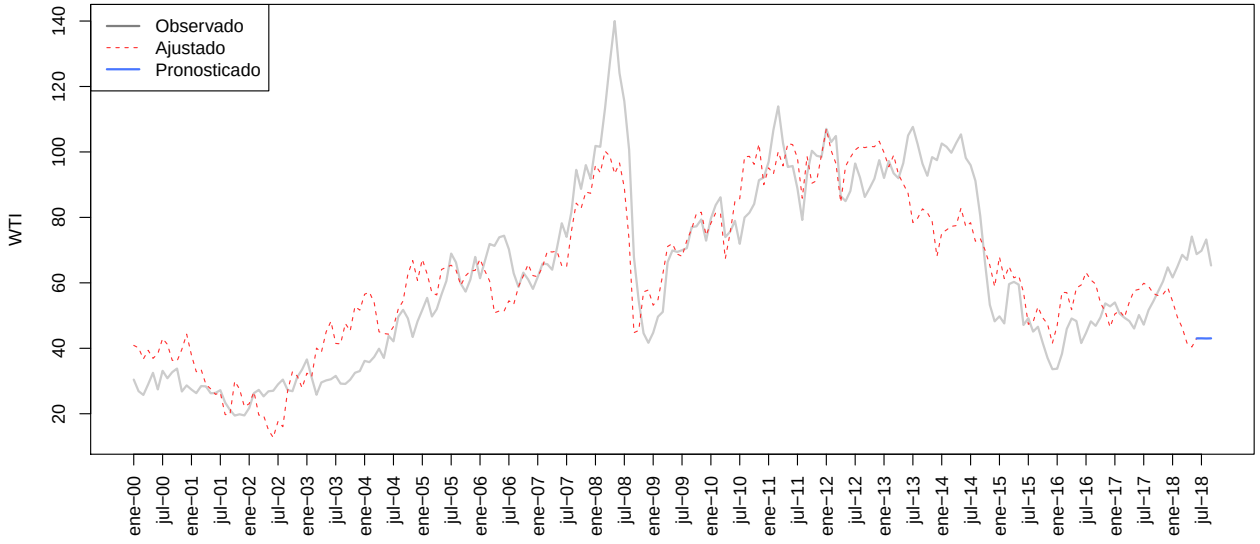

Figura 4: Ajuste y Prediccin: Modelo Esttico

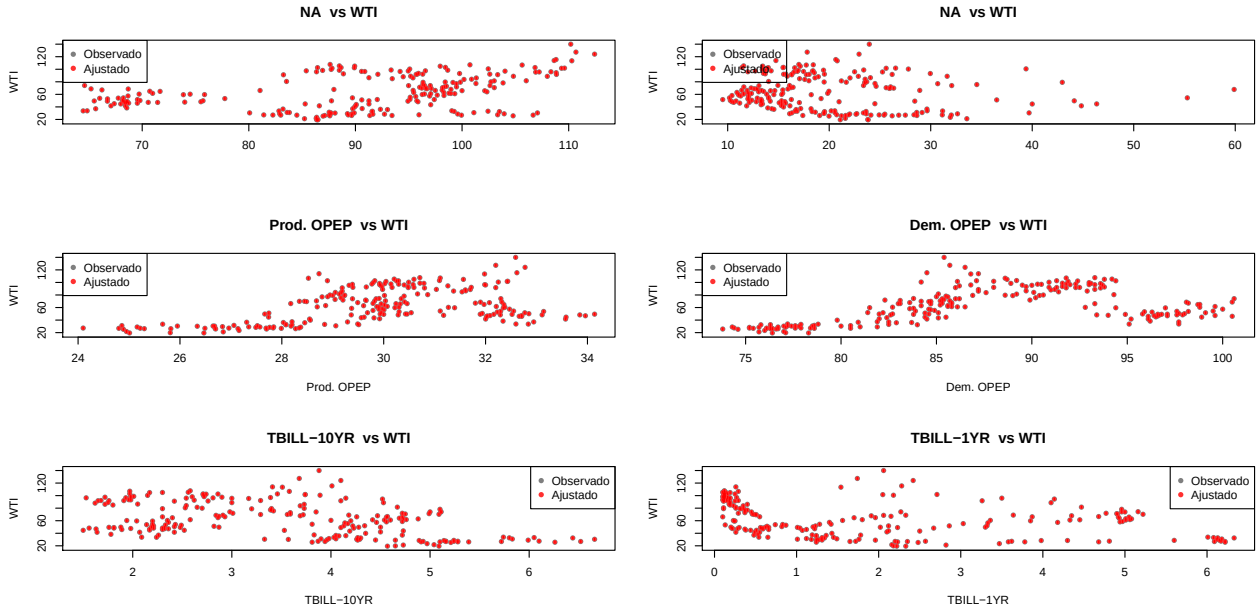

Figura 5: Regresores vs WTI: Modelo Dinmico

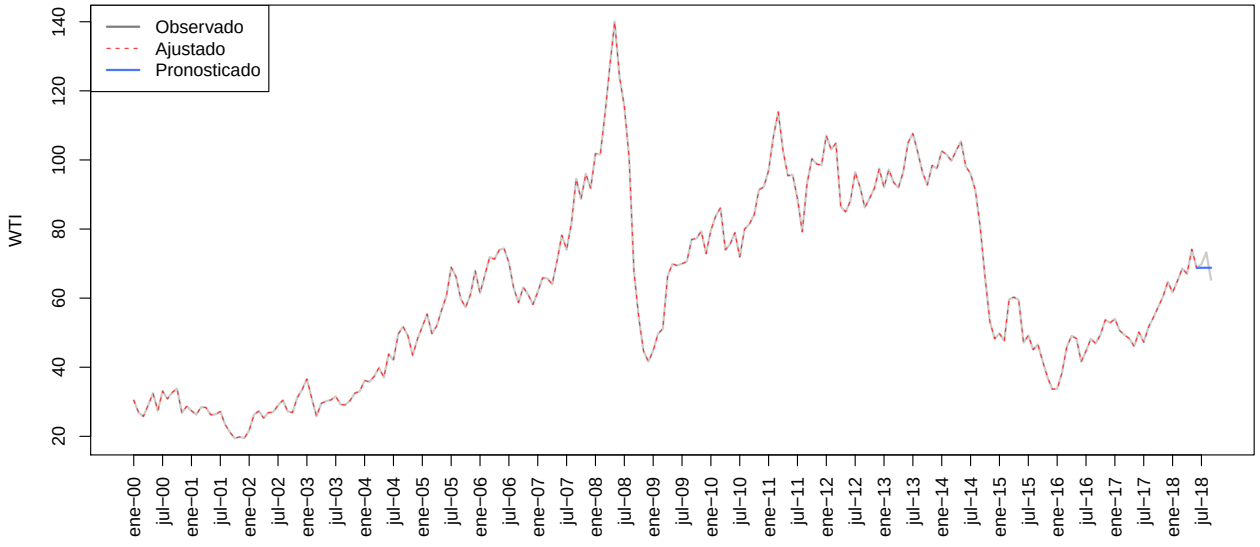

Figura 6: Ajuste y Prediccin: Modelo Dinmico

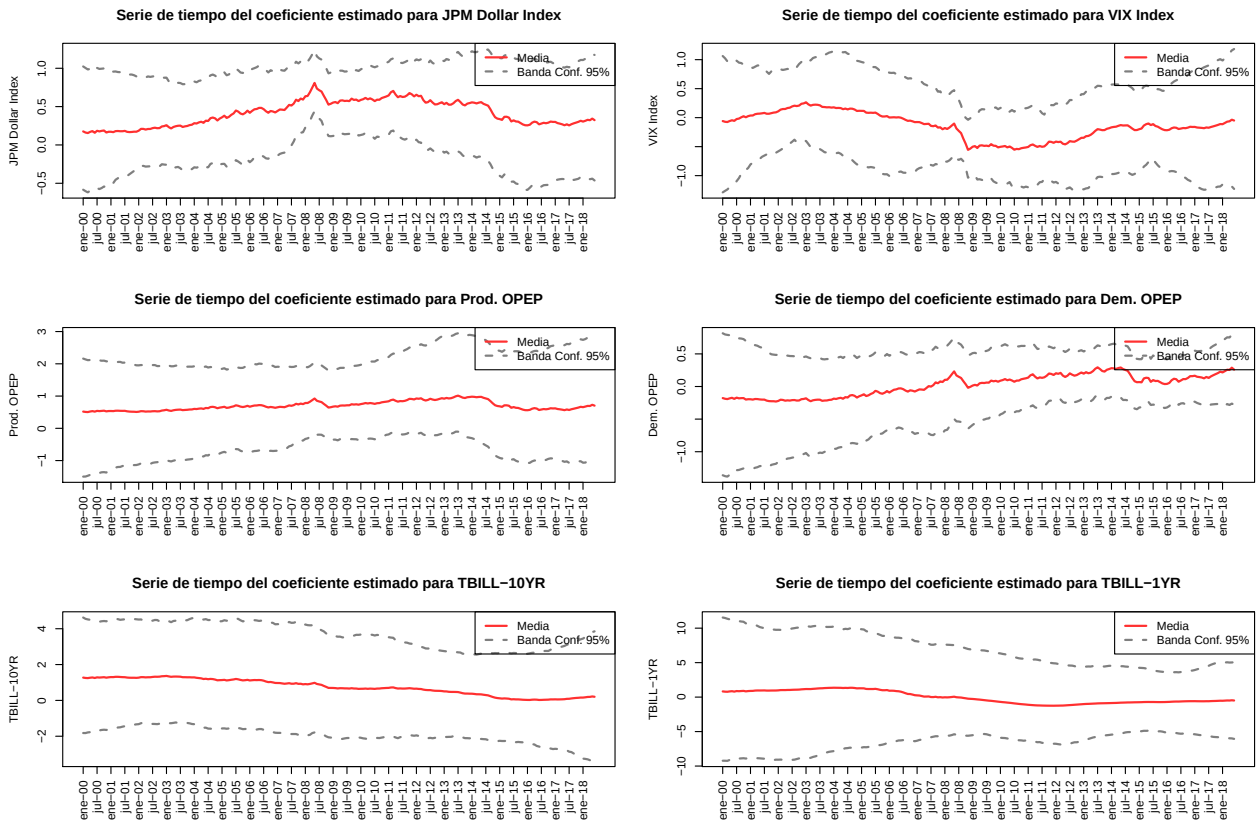

Figura 7: Coeficientes Estimados: Modelo Dinmico

```
## [[1]]$rect$h
## [1] 0.5505142
##
## [[1]]$rect$left
## [1] 170.3567
##
## [[1]]$rect$top
## [1] 1.325706
##
##
## [[1]]$text
## [[1]]$text$x
## [1] 188.5977 188.5977
##
## [[1]]$text$y
## [1] 1.1422008 0.9586961
##
##
##
## [[2]]
## [[2]]$rect
## [[2]]$rect$w
## [1] 60.48327
##
## [[2]]$rect$h
## [1] 0.7279053
##
## [[2]]$rect$left
## [1] 170.3567
##
## [[2]]$rect$top
## [1] 1.282303
##
##
## [[2]]$text
## [[2]]$text$x
## [1] 188.5977 188.5977
##
## [[2]]$text$y
## [1] 1.0396680 0.7970329
##
##
##
## [[3]]
## [[3]]$rect
## [[3]]$rect$w
## [1] 60.48327
##
## [[3]]$rect$h
## [1] 1.308685
##
## [[3]]$rect$left
## [1] 170.3567
##
```

```
## [[3]]$rect$top
## [1] 3.124749
##
##
## [[3]]$text
## [[3]]$text$x
## [1] 188.5977 188.5977
##
## [[3]]$text$y
## [1] 2.688520 2.252292
##
##
##
## [[4]]
## [[4]]$rect
## [[4]]$rect$w
## [1] 60.48327
##
## [[4]]$rect$h
## [1] 0.6472378
##
## [[4]]$rect$left
## [1] 170.3567
##
## [[4]]$rect$top
## [1] 0.9041587
##
##
## [[4]]$text
## [[4]]$text$x
## [1] 188.5977 188.5977
##
## [[4]]$text$y
## [1] 0.6884128 0.4726668
##
##
##
## [[5]]
## [[5]]$rect
## [[5]]$rect$w
## [1] 60.48327
##
## [[5]]$rect$h
## [1] 2.355903
##
## [[5]]$rect$left
## [1] 170.3567
##
## [[5]]$rect$top
## [1] 4.946386
##
##
## [[5]]$text
## [[5]]$text$x
```

```
## [1] 188.5977 188.5977
##
## [[5]]$text$y
## [1] 4.161085 3.375784
##
##
##
## [[6]]
## [[6]]$rect
## [[6]]$rect$w
## [1] 60.48327
##
## [[6]]$rect$h
## [1] 6.121526
##
## [[6]]$rect$left
## [1] 170.3567
##
## [[6]]$rect$top
## [1] 12.37491
##
##
## [[6]]$text
## [[6]]$text$x
## [1] 188.5977 188.5977
##
## [[6]]$text$y
## [1] 10.334403  8.293895
```

6. GLM Dinámico con intercepto estático

```
## [1] "DIC=19833.7722540483"
```

7. GLM Dinámico con suavizamiento

```
## [1] 26799.46
```

```
## [[1]]
## [[1]]$rect
## [[1]]$rect$w
## [1] 60.48327
##
## [[1]]$rect$h
## [1] 0.249953
##
## [[1]]$rect$left
## [1] 170.3567
##
## [[1]]$rect$top
## [1] 0.7856705
##
```

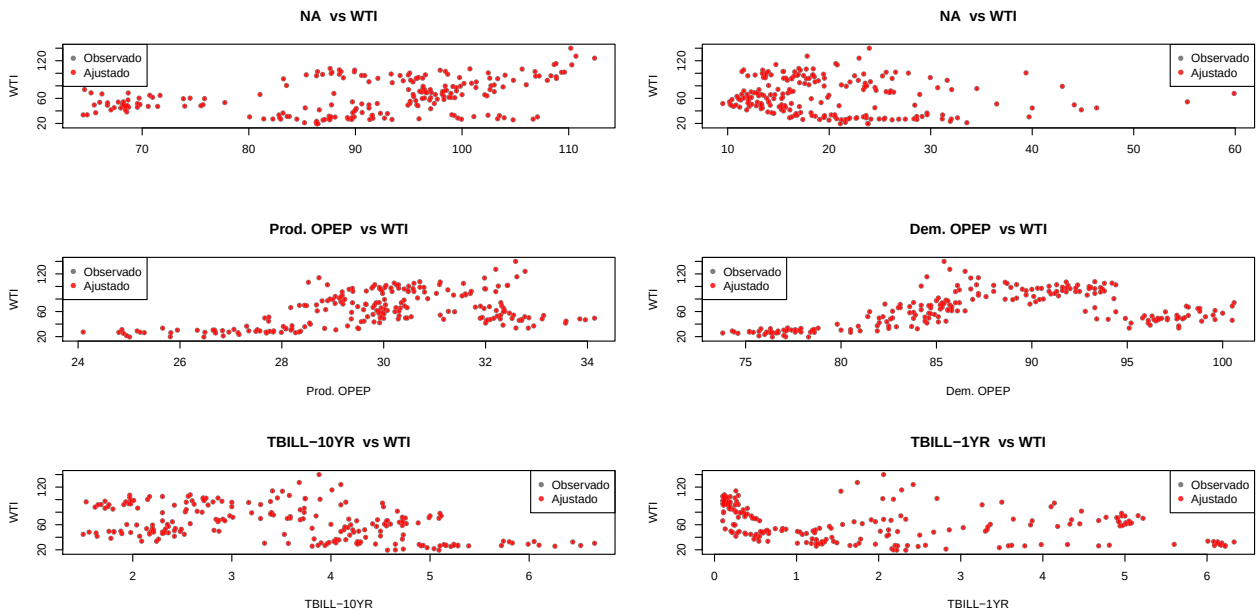

Figura 8: Regresores vs WTI: Modelo Dinmico con Intercepto Esttico

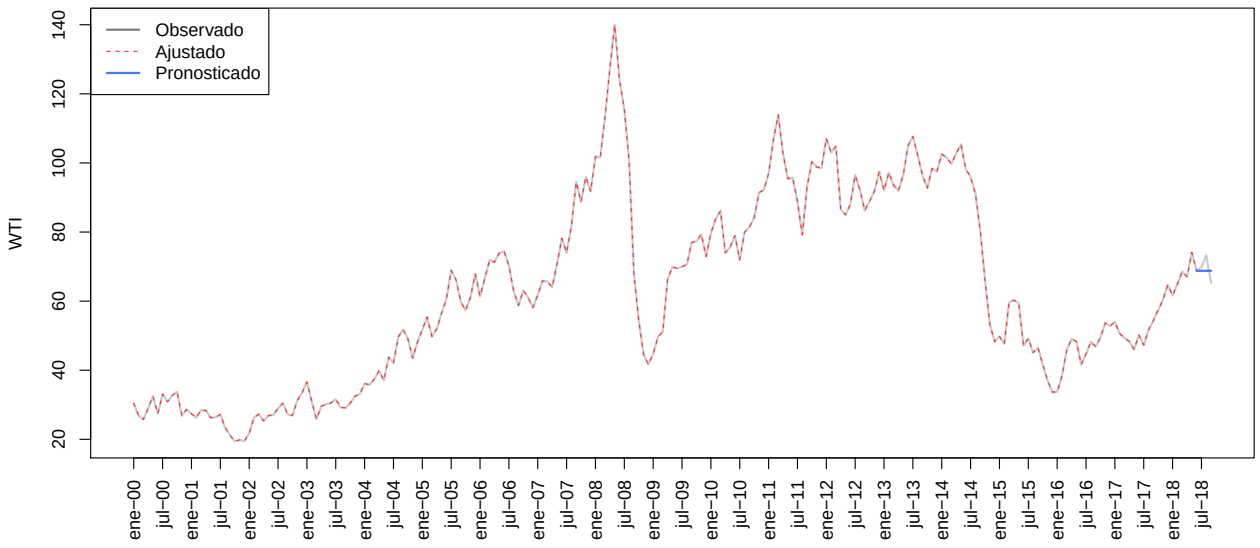

Figura 9: Ajuste y Prediccin: Modelo Dinmico

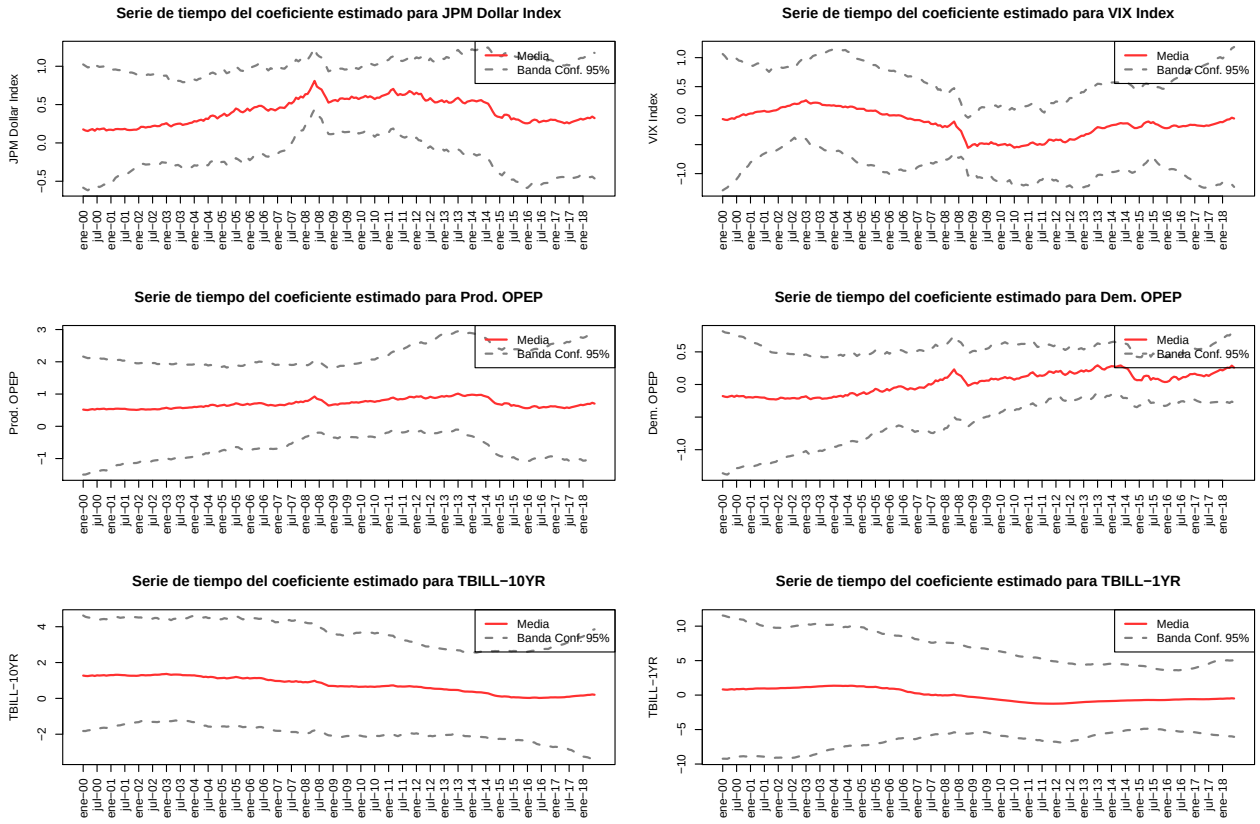

Figura 10: Coeficientes Estimados: Modelo Dinmico con Intercepto Esttico

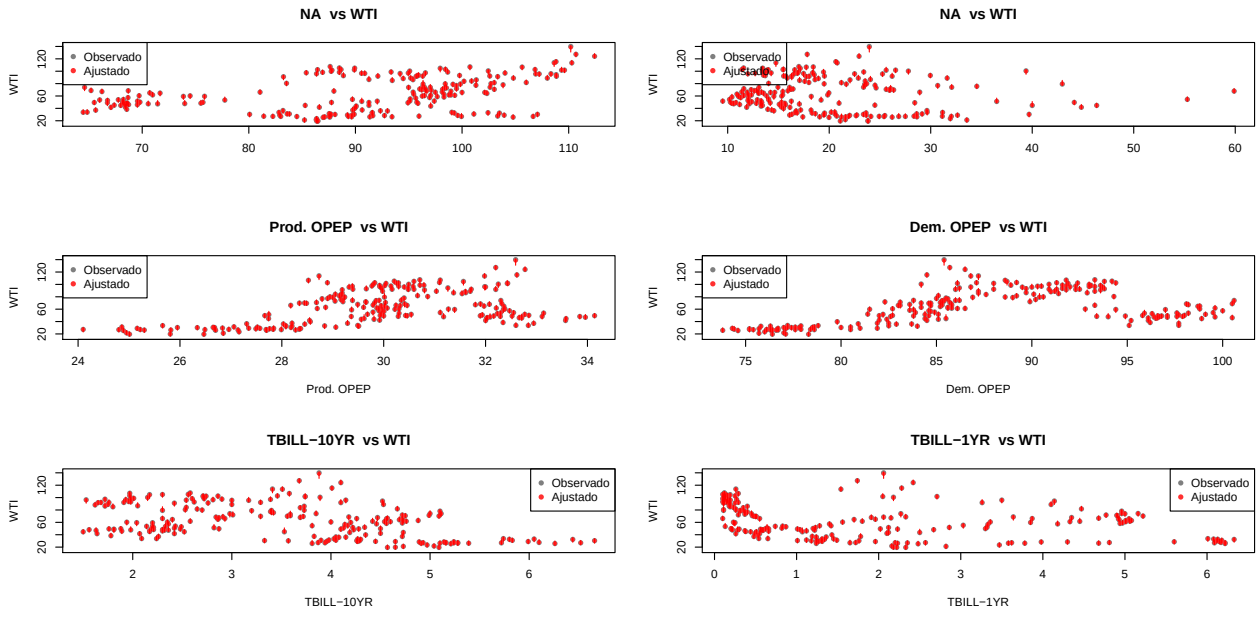

Figura 11: Regresores vs WTI: Modelo Dinmico con Suavizamiento

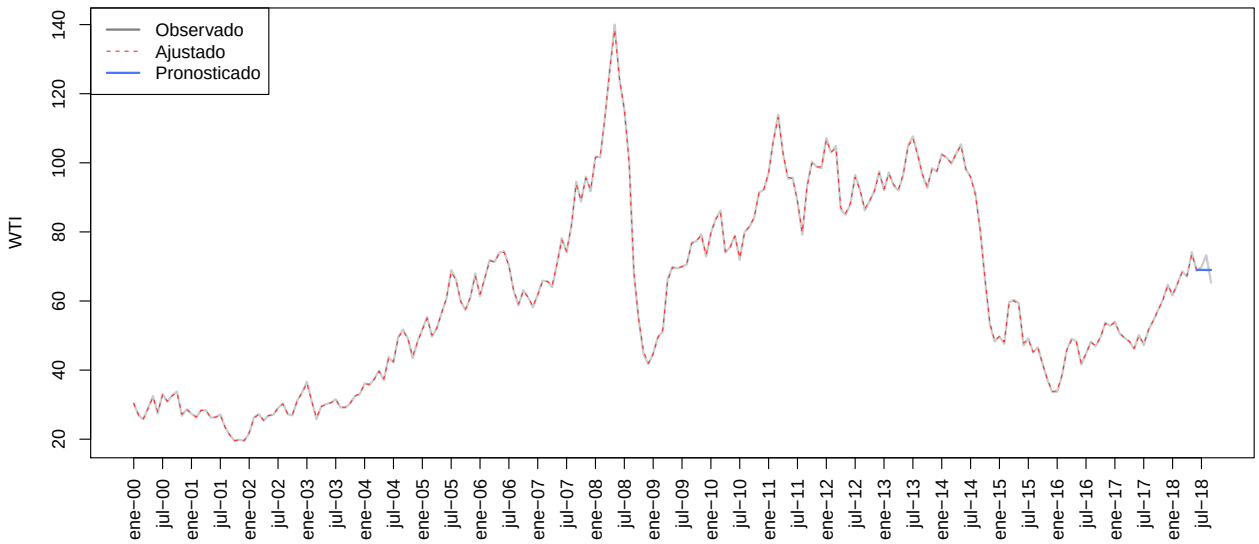

Figura 12: Ajuste y Prediccin: Modelo Dinmico con Suavizamiento

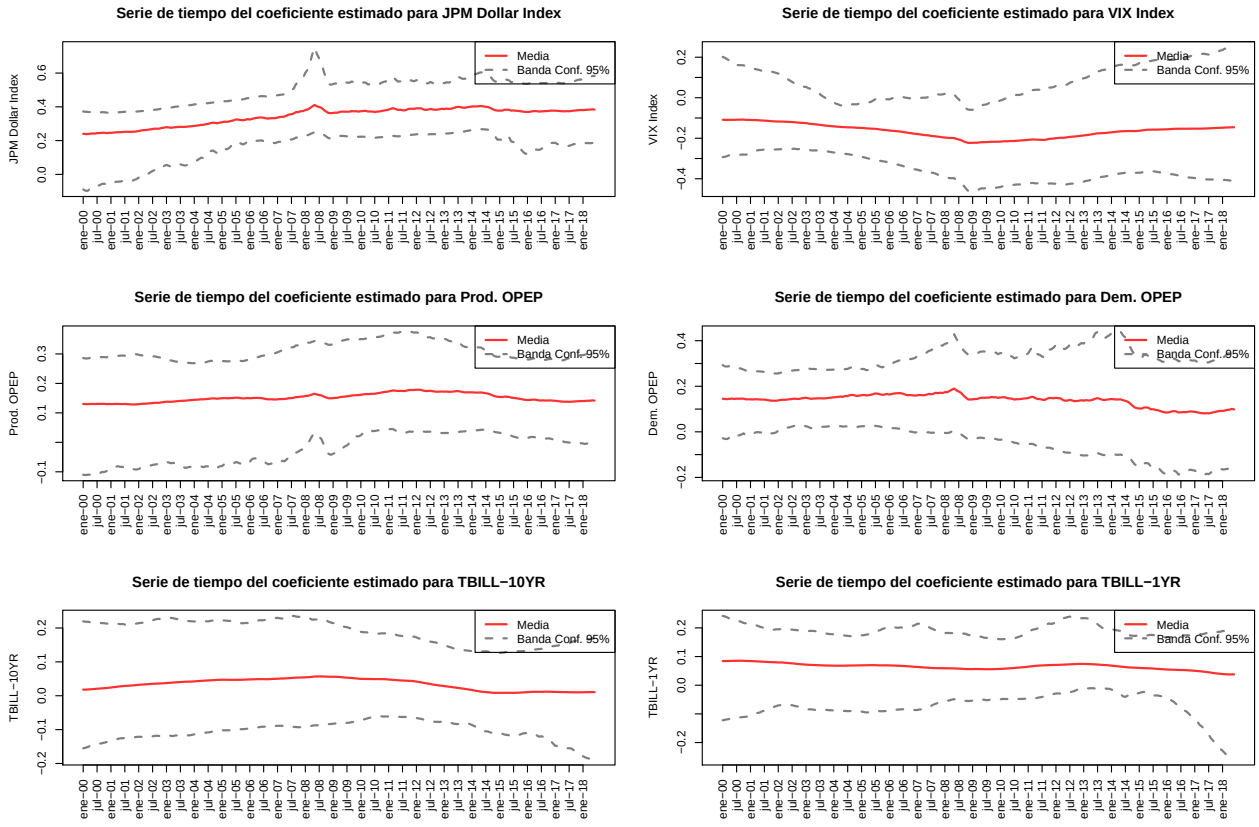

Figura 13: Coeficientes Estimados: Modelo Dinmico con Suavizamiento

```
##
## [[1]]$text
## [[1]]$text$x
## [1] 188.5977 188.5977
##
## [[1]]$text$y
## [1] 0.7023529 0.6190352
##
##
##
## [[2]]
## [[2]]$rect
## [[2]]$rect$w
## [1] 60.48327
##
## [[2]]$rect$h
## [1] 0.2083303
##
## [[2]]$rect$left
## [1] 170.3567
##
## [[2]]$rect$top
## [1] 0.2765159
##
##
## [[2]]$text
## [[2]]$text$x
## [1] 188.5977 188.5977
##
## [[2]]$text$y
## [1] 0.2070725 0.1376291
##
##
##
## [[3]]
## [[3]]$rect
## [[3]]$rect$w
## [1] 60.48327
##
## [[3]]$rect$h
## [1] 0.1432355
##
## [[3]]$rect$left
## [1] 170.3567
##
## [[3]]$rect$top
## [1] 0.3949701
##
##
## [[3]]$text
## [[3]]$text$x
## [1] 188.5977 188.5977
##
## [[3]]$text$y
```

```
## [1] 0.3472249 0.2994798
##
##
##
## [[4]]
## [[4]]$rect
## [[4]]$rect$w
## [1] 60.48327
##
## [[4]]$rect$h
## [1] 0.185284
##
## [[4]]$rect$left
## [1] 170.3567
##
## [[4]]$rect$top
## [1] 0.4648223
##
##
## [[4]]$text
## [[4]]$text$x
## [1] 188.5977 188.5977
##
## [[4]]$text$y
## [1] 0.4030609 0.3412996
##
##
##
## [[5]]
## [[5]]$rect
## [[5]]$rect$w
## [1] 60.48327
##
## [[5]]$rect$h
## [1] 0.1246149
##
## [[5]]$rect$left
## [1] 170.3567
##
## [[5]]$rect$top
## [1] 0.2525852
##
##
## [[5]]$text
## [[5]]$text$x
## [1] 188.5977 188.5977
##
## [[5]]$text$y
## [1] 0.2110469 0.1695086
##
##
##
## [[6]]
## [[6]]$rect
```

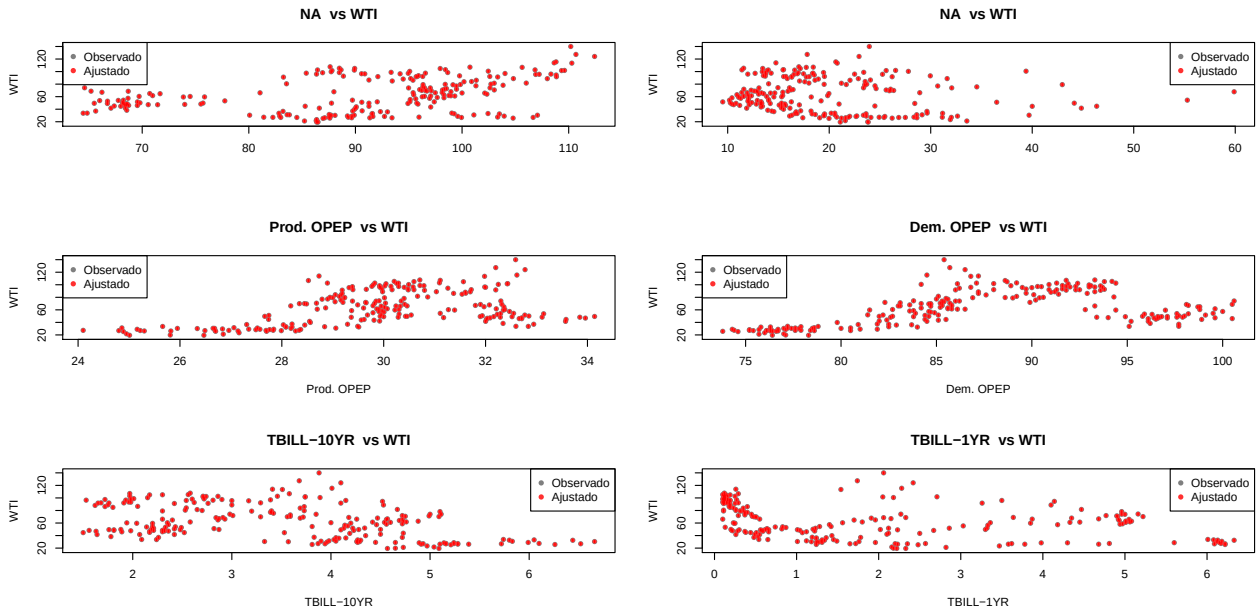

Figura 14: Regresores vs WTI: Modelo Dinmico con Intercepto Esttico y Suavizamiento

```
## [[6]]$rect$w
## [1] 60.48327
##
## [[6]]$rect$h
## [1] 0.1472238
##
## [[6]]$rect$left
## [1] 170.3567
##
## [[6]]$rect$top
## [1] 0.2617059
##
##
## [[6]]$text
## [[6]]$text$x
## [1] 188.5977 188.5977
##
## [[6]]$text$y
## [1] 0.2126313 0.1635567
```

8. GLM Dinámico con Intercepto Estático y Suavizamiento

```
## [1] 19833.77
```

```
## [[1]]
## [[1]]$rect
## [[1]]$rect$w
## [1] 60.48327
##
## [[1]]$rect$h
```

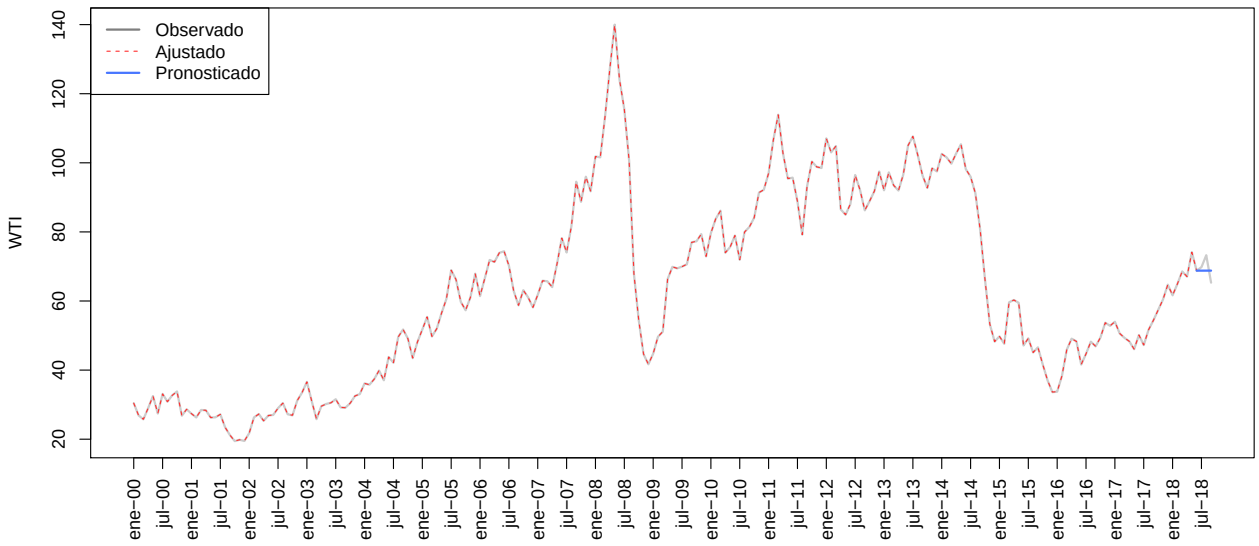

Figura 15: Ajuste y Prediccin: Modelo Dinmico con Intercepto Esttico y Suavizamiento

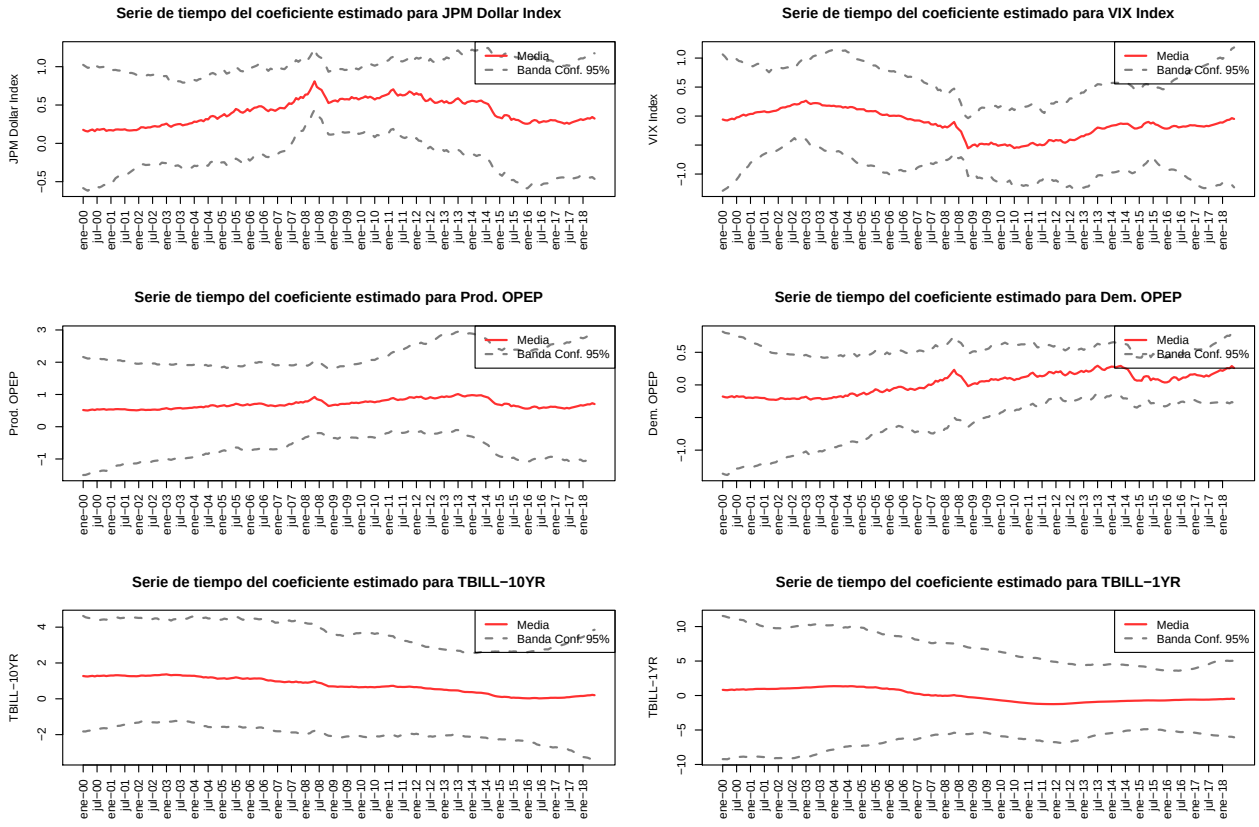

Figura 16: Coeficientes Estimados: Modelo Dinmico con Intercepto Esttico y Suavizamiento

```
## [1] 0.5505142
##
## [[1]]$rect$left
## [1] 170.3567
##
## [[1]]$rect$top
## [1] 1.325706
##
##
## [[1]]$text
## [[1]]$text$x
## [1] 188.5977 188.5977
##
## [[1]]$text$y
## [1] 1.1422008 0.9586961
##
##
##
## [[2]]
## [[2]]$rect
## [[2]]$rect$w
## [1] 60.48327
##
## [[2]]$rect$h
## [1] 0.7279053
##
## [[2]]$rect$left
## [1] 170.3567
##
## [[2]]$rect$top
## [1] 1.282303
##
##
## [[2]]$text
## [[2]]$text$x
## [1] 188.5977 188.5977
##
## [[2]]$text$y
## [1] 1.0396680 0.7970329
##
##
##
## [[3]]
## [[3]]$rect
## [[3]]$rect$w
## [1] 60.48327
##
## [[3]]$rect$h
## [1] 1.308685
##
## [[3]]$rect$left
## [1] 170.3567
##
## [[3]]$rect$top
```

```
## [1] 3.124749
##
##
## [[3]]$text
## [[3]]$text$x
## [1] 188.5977 188.5977
##
## [[3]]$text$y
## [1] 2.688520 2.252292
##
##
##
## [[4]]
## [[4]]$rect
## [[4]]$rect$w
## [1] 60.48327
##
## [[4]]$rect$h
## [1] 0.6472378
##
## [[4]]$rect$left
## [1] 170.3567
##
## [[4]]$rect$top
## [1] 0.9041587
##
##
## [[4]]$text
## [[4]]$text$x
## [1] 188.5977 188.5977
##
## [[4]]$text$y
## [1] 0.6884128 0.4726668
##
##
##
## [[5]]
## [[5]]$rect
## [[5]]$rect$w
## [1] 60.48327
##
## [[5]]$rect$h
## [1] 2.355903
##
## [[5]]$rect$left
## [1] 170.3567
##
## [[5]]$rect$top
## [1] 4.946386
##
##
## [[5]]$text
## [[5]]$text$x
## [1] 188.5977 188.5977
```

```
##
## [[5]]$text$y
## [1] 4.161085 3.375784
##
##
##
## [[6]]
## [[6]]$rect
## [[6]]$rect$w
## [1] 60.48327
##
## [[6]]$rect$h
## [1] 6.121526
##
## [[6]]$rect$left
## [1] 170.3567
##
## [[6]]$rect$top
## [1] 12.37491
##
##
## [[6]]$text
## [[6]]$text$x
## [1] 188.5977 188.5977
##
## [[6]]$text$y
## [1] 10.334403  8.293895
```