

Proyecto 1, Modelos de Gestión Financiera

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25 de septiembre de 2019

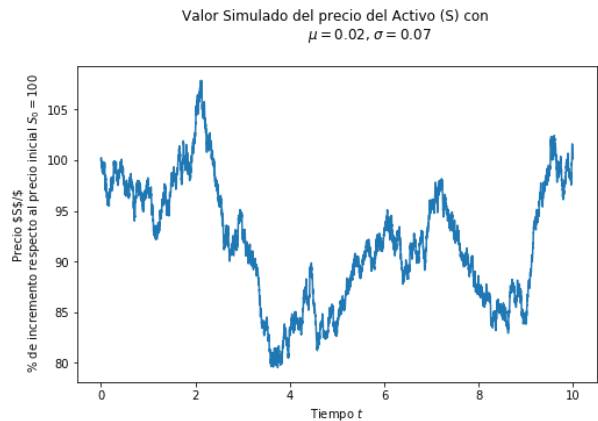
Punto 1

```
In [13]: from simulador_S import grafico_valor_activo

import numpy as np
import matplotlib.pyplot as plt
import time
%matplotlib inline
```

Función para simulación

```
In [11]: grafico_valor_activo(S0 = 100, mu = 0.02, sig = 0.07, dt = 0.001, Dt = 1, N = 10, graficar = True, pts = 0, txtad = "")
```



```
Out[11]: (array([0.000e+00, 1.000e-03, 2.000e-03, ..., 9.998e+00, 9.999e+00,
1.000e+01]),
array([100., 100.24523978, 100.21872879, ..., 100.16475906,
100.11972553, 100.46219539]))
```

```
In [2]: def est_precis(ddt, mmu = 0.9, Ene = 48):
start = time.time()
ts, Ss = grafico_valor_activo(S0 = 1, mu = mmu, sig = 0, dt = ddt, Dt = 3, N = Ene, graficar = False)
t = ts[-1]
exCalc = Ss[-1]
exReal = np.exp(mmu*t)
error = np.abs(exCalc/exReal - 1)
print("Para dt =", ddt, ", e**(", mmu, t, ") calculado:\t", exCalc)
print("Para dt =", ddt, ", e**(", mmu, t, ") real:\t", exReal)
print("Asi que, para dt =", ddt, " hubo un error de:", error*100, "%")
print("Tiempo: ", time.time() - start, "\n")
est_precis(ddt = 0.0001)
est_precis(ddt = 0.0005)
est_precis(ddt = 0.001)
est_precis(ddt = 0.01)
```

Para dt = 0.0001 , e**(0.9 144.0) calculado: 1.9143978647135023e+56
Para dt = 0.0001 , e**(0.9 144.0) real: 1.9255945791484567e+56
Asi que, para dt = 0.0001 hubo un error de: 0.5814679037944637 %
Tiempo: 10.732323408126831

Para dt = 0.0005 , e**(0.9 144.0) calculado: 1.8702713688723112e+56
Para dt = 0.0005 , e**(0.9 144.0) real: 1.9255945791484567e+56
Asi que, para dt = 0.0005 hubo un error de: 2.8730455971999413 %
Tiempo: 2.2553927898406982

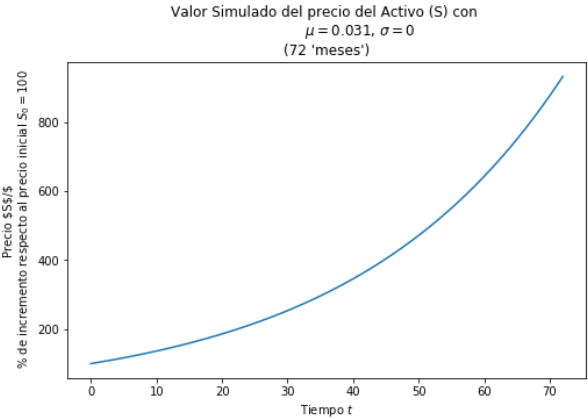
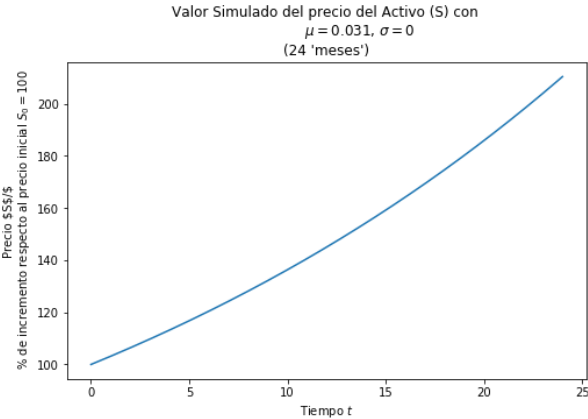
Para dt = 0.001 , e**(0.9 144.0) calculado: 1.816569369920516e+56
Para dt = 0.001 , e**(0.9 144.0) real: 1.9255945791484567e+56
Asi que, para dt = 0.001 hubo un error de: 5.661898429115553 %
Tiempo: 1.14546537399292

Para dt = 0.01 , e**(0.9 144.0) calculado: 1.0784345960075816e+56
Para dt = 0.01 , e**(0.9 144.0) real: 1.9255945791484567e+56
Asi que, para dt = 0.01 hubo un error de: 43.99472206218555 %
Tiempo: 0.10913729667663574

$\mu = 0.031$

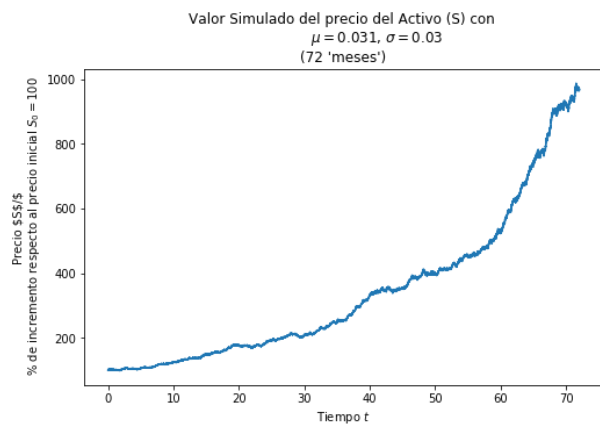
$\sigma = 0$

```
In [3]: # Mes
_ = grafico_valor_activo(mu = 0.031, sig = 0, Dt = 1, N = 24, txtad = "(24 'meses')") # mu y sigma de amazon de septiembre de 2017 a septiembre de 20
19
_ = grafico_valor_activo(mu = 0.031, sig = 0, Dt = 1, N = 24*3, txtad = "(72 'meses')")
```



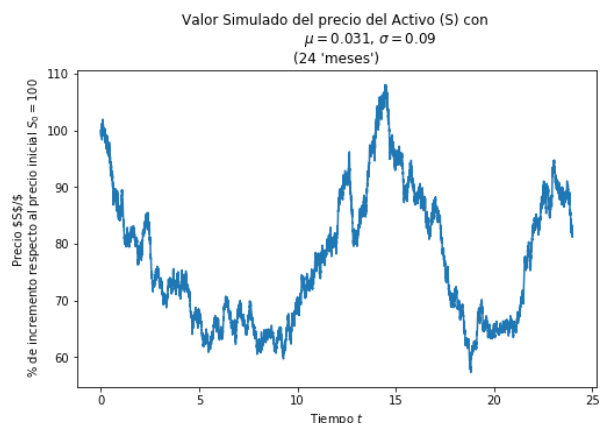
$\sigma = 0.03$

```
In [4]: # Mes
l = grafico_valor_activo(mu = 0.031, sig = 0.03, Dt = 1, N = 24, txtad = "(24 'meses')") # mu y sigma de amazon de septiembre de 2017 a septiembre de 2019
l = grafico_valor_activo(mu = 0.031, sig = 0.03, Dt = 1, N = 24, txtad = "(24 'meses')")
l = grafico_valor_activo(mu = 0.031, sig = 0.03, Dt = 1, N = 24*3, txtad = "(72 'meses')")
l = grafico_valor_activo(mu = 0.031, sig = 0.03, Dt = 1, N = 24*3, txtad = "(72 'meses')")
```



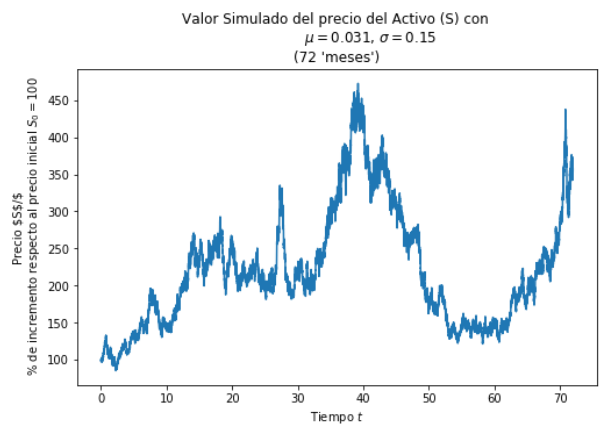
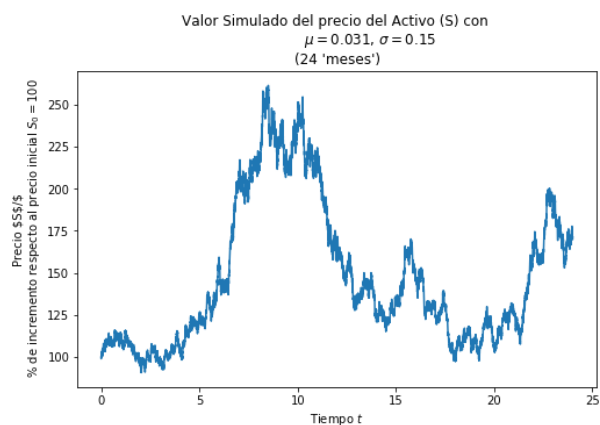
$\sigma = 0.09$

```
In [5]: # Mes
# mu y sigma de amazon de septiembre de 2017 a septiembre de 2019
l = grafico_valor_activo(mu = 0.031, sig = 0.09, Dt = 1, N = 24, txtad = "(24 'meses')")
l = grafico_valor_activo(mu = 0.031, sig = 0.09, Dt = 1, N = 24, txtad = "(24 'meses')")
l = grafico_valor_activo(mu = 0.031, sig = 0.09, Dt = 1, N = 24*3, txtad = "(72 'meses')")
l = grafico_valor_activo(mu = 0.031, sig = 0.09, Dt = 1, N = 24*3, txtad = "(72 'meses')")
```



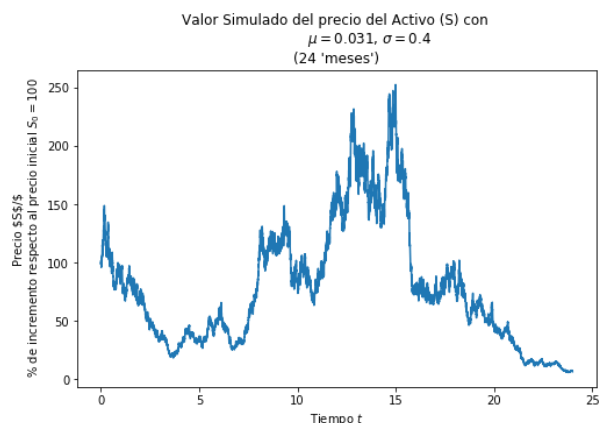
$\sigma = 0.15$

```
In [6]: # Mes
l = grafico_valor_activo(mu = 0.031, sig = 0.15, Dt = 1, N = 24, txtad = "(24 'meses')") # mu y sigma de amazon de septiembre de 2017 a septiembre de 2019
l = grafico_valor_activo(mu = 0.031, sig = 0.15, Dt = 1, N = 24, txtad = "(24 'meses')")
l = grafico_valor_activo(mu = 0.031, sig = 0.15, Dt = 1, N = 24*3, txtad = "(72 'meses')")
l = grafico_valor_activo(mu = 0.031, sig = 0.15, Dt = 1, N = 24*3, txtad = "(72 'meses')")
```



$\sigma = 0.4$

```
In [7]: # Mes
_= grafico_valor_activo(mu = 0.031, sig = 0.4, Dt = 1, N = 24, txtad = "(24 'meses')") # mu y sigma de amazon de septiembre de 2017 a septiembre de 2019
_= grafico_valor_activo(mu = 0.031, sig = 0.4, Dt = 1, N = 24, txtad = "(24 'meses')")
_= grafico_valor_activo(mu = 0.031, sig = 0.4, Dt = 1, N = 24*3, txtad = "(72 'meses')")
_= grafico_valor_activo(mu = 0.031, sig = 0.4, Dt = 1, N = 24*3, txtad = "(72 'meses')")
```



```
In [8]: # Mes
_ = grafico_valor_activo(mu = 0.031, sig = 1, Dt = 1, N = 24, txtad = "(24 'meses')") #  $\mu$  y  $\sigma$  de amazon de septiembre de 2017 a septiembre de 2019
_ = grafico_valor_activo(mu = 0.031, sig = 1, Dt = 1, N = 24*3, txtad = "(72 'meses')")
```



Otros μ 's

```
In [20]: def plot_texto(texto, taman):
_ = plt.figure(figsize = (3,1))
_ = plt.axis('off')
_ = plt.text(0, 0, texto, fontsize=taman)
```

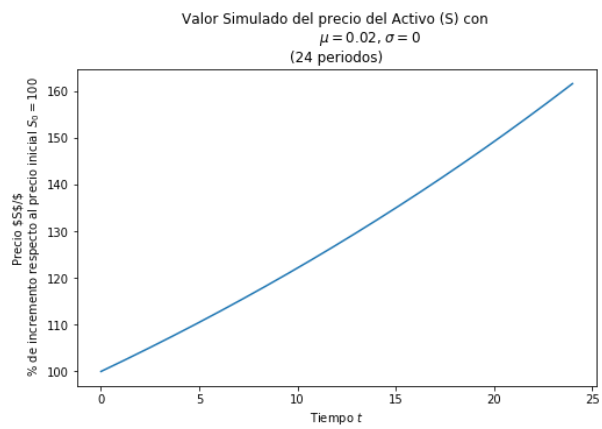
```
In [26]: mus = [0.02, 0.2, 1]
sigs = [0, 0.005, 0.05, 0.4, 0.8, 1.1, 2]

for mmu in mus:
    plot_texto("$\mu$ = " + str(mmu), 30)

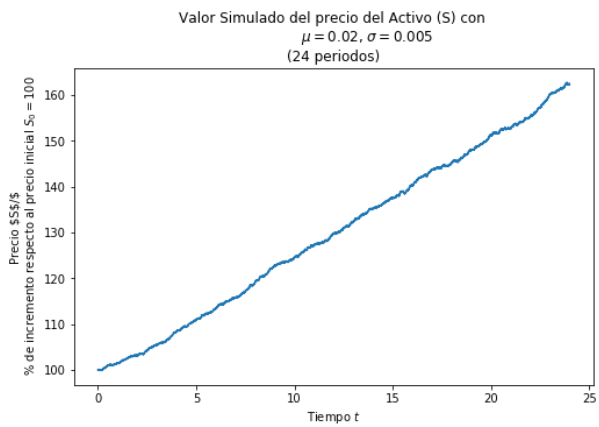
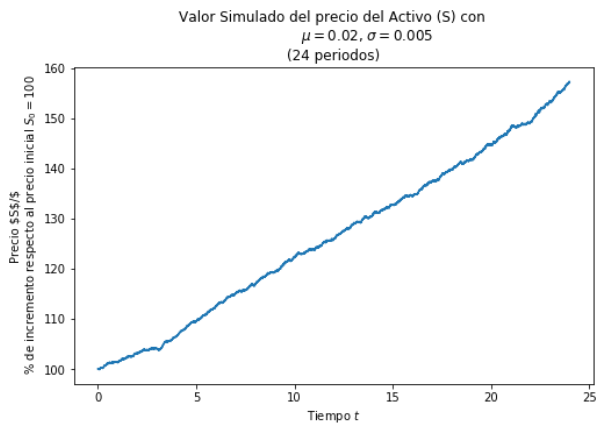
    for ssig in sigs:
        plot_texto("$\sigma$ = " + str(ssig), 18)
        _ = grafico_valor_activo(mu = mmu, sig = ssig, Dt = 1, N = 24, txtad = "(24 periodos)") # mu y sigma de amazon de septiembre de 2017 a septie
mbre de 2019
        _ = grafico_valor_activo(mu = mmu, sig = ssig, Dt = 1, N = 24, txtad = "(24 periodos)")
        _ = grafico_valor_activo(mu = mmu, sig = ssig, Dt = 1, N = 24*3, txtad = "(72 periodos)")
        _ = grafico_valor_activo(mu = mmu, sig = ssig, Dt = 1, N = 24*3, txtad = "(72 periodos)")
```


$$\mu = 0.02$$

$$\sigma = 0$$



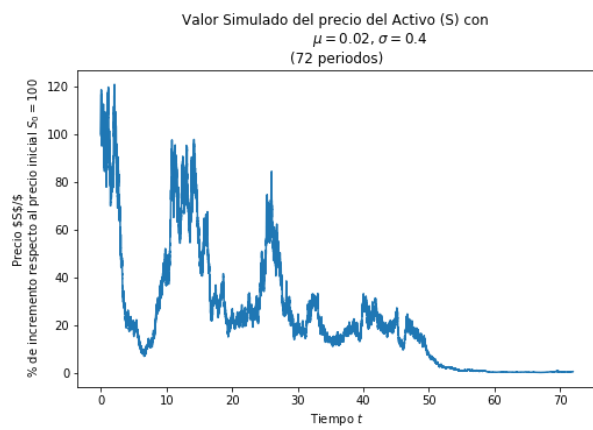
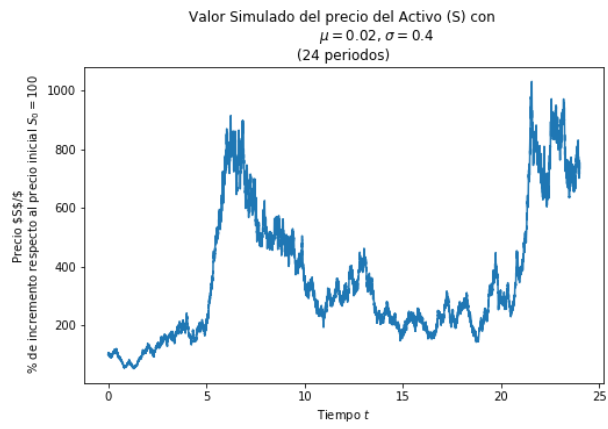
$\sigma = 0.005$



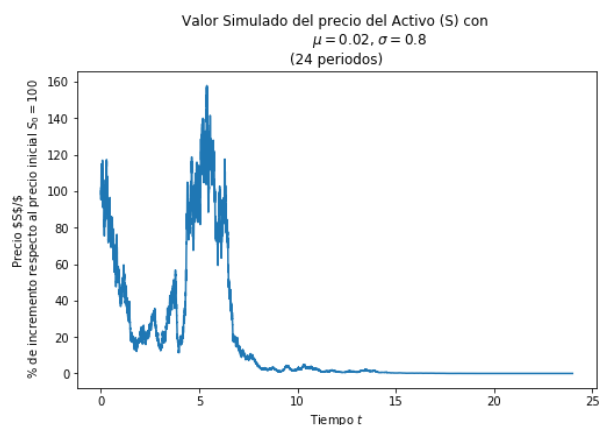
$\sigma = 0.05$



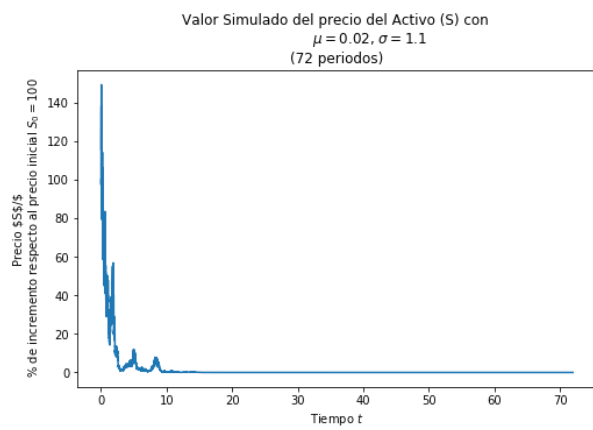
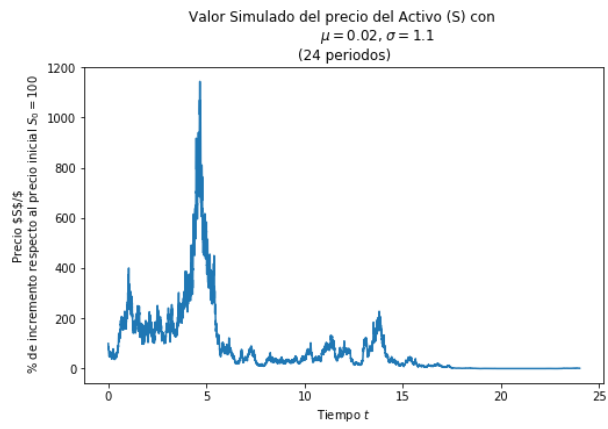
$\sigma = 0.4$



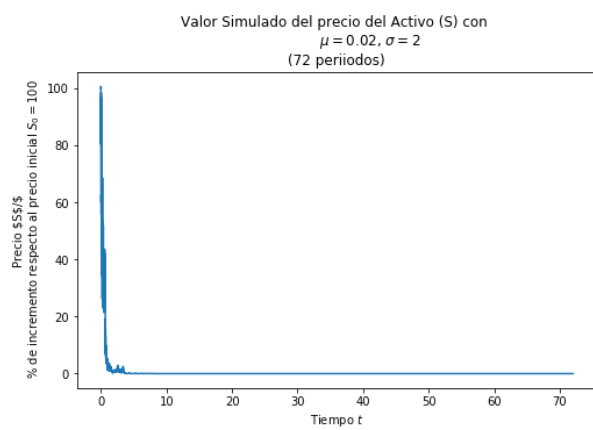
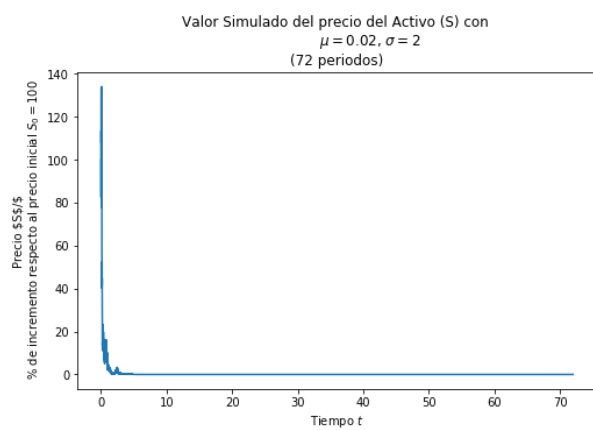
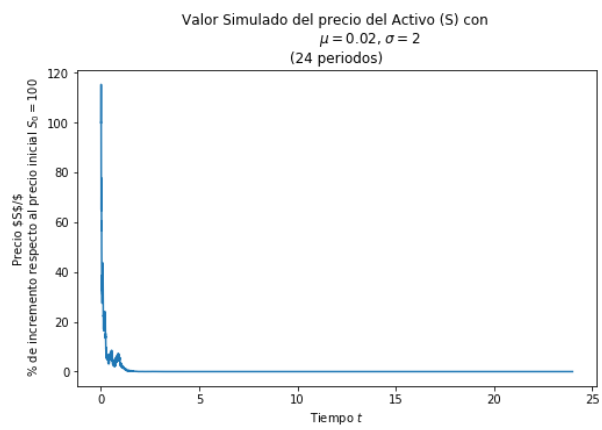
$\sigma = 0.8$



$\sigma = 1.1$



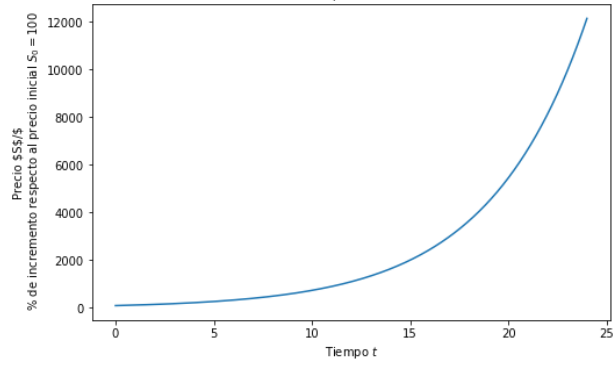
$\sigma = 2$



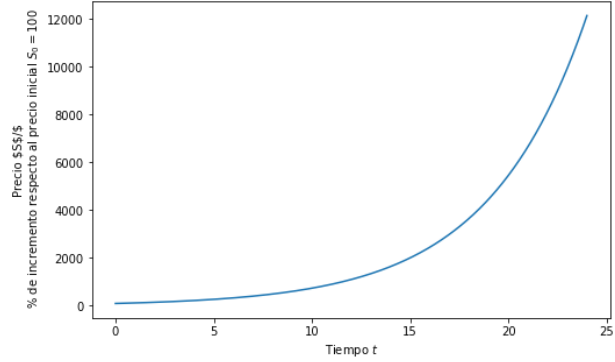
$$\mu = 0.2$$

$$\sigma = 0$$

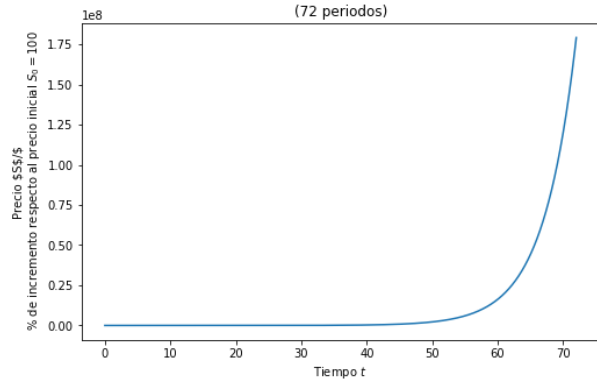
Valor Simulado del precio del Activo (S) con
 $\mu = 0.2, \sigma = 0$
 (24 periodos)



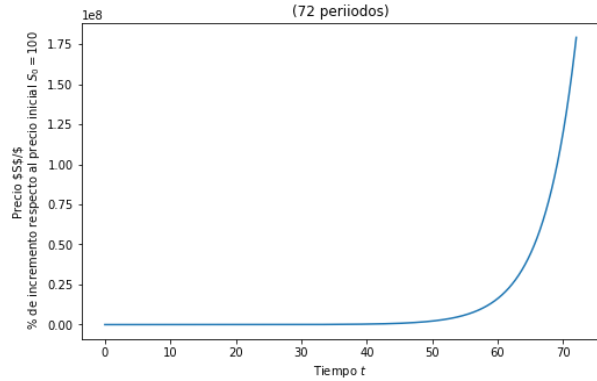
Valor Simulado del precio del Activo (S) con
 $\mu = 0.2, \sigma = 0$
 (24 periodos)



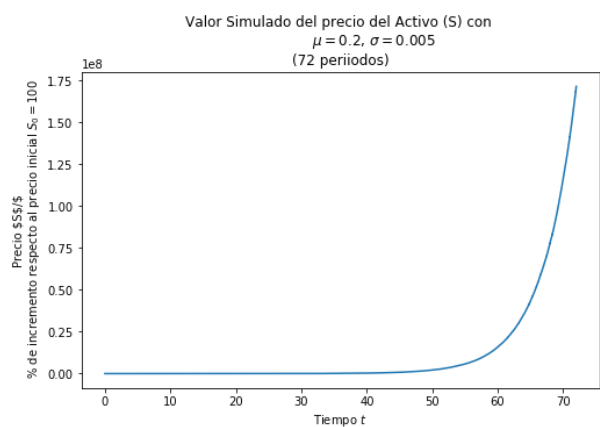
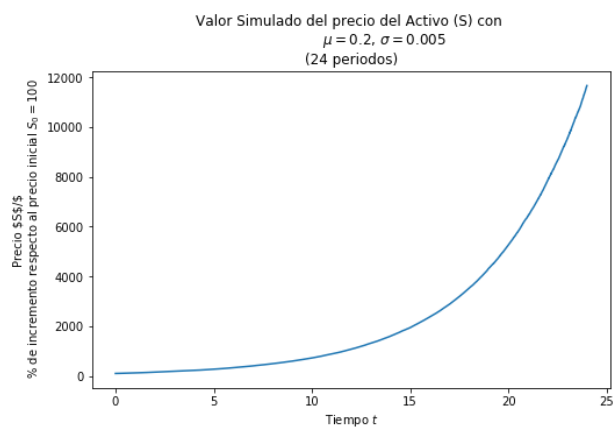
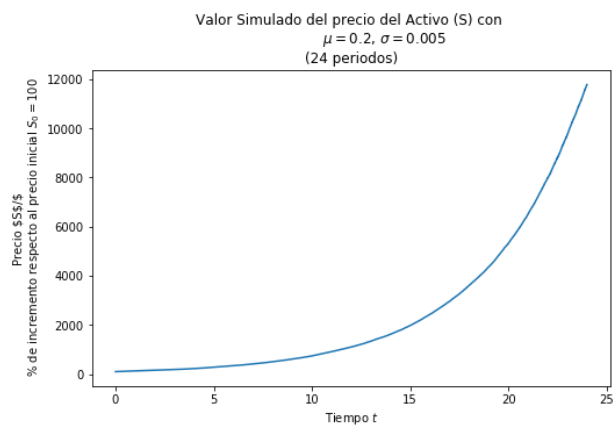
Valor Simulado del precio del Activo (S) con
 $\mu = 0.2, \sigma = 0$
 (72 periodos)



Valor Simulado del precio del Activo (S) con
 $\mu = 0.2, \sigma = 0$
 (72 periodos)

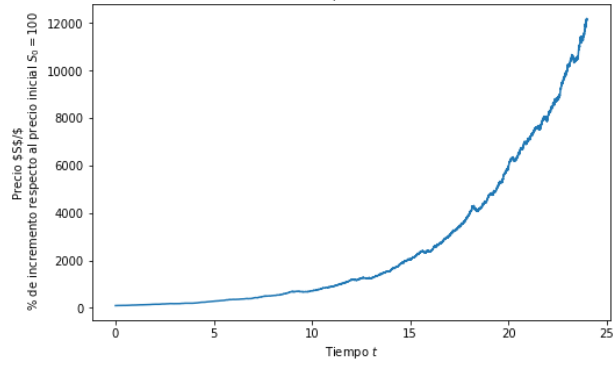


$\sigma = 0.005$

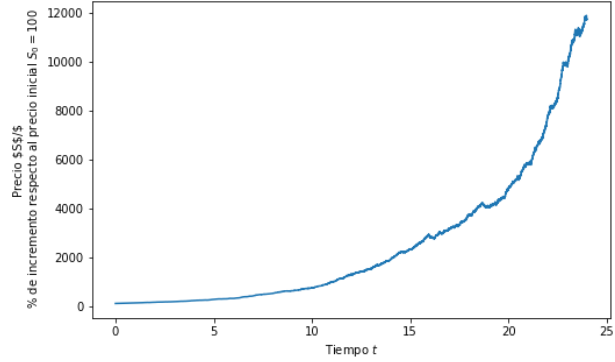


$\sigma = 0.05$

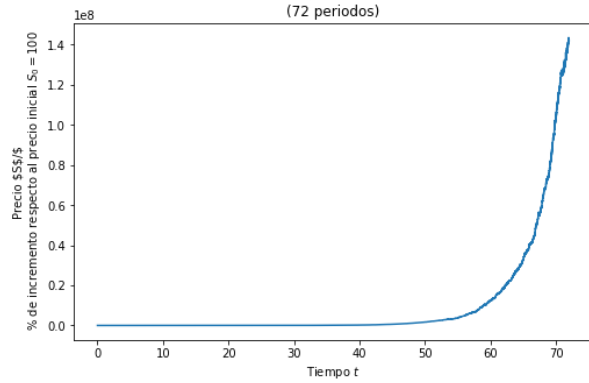
Valor Simulado del precio del Activo (S) con
 $\mu = 0.2, \sigma = 0.05$
 (24 periodos)



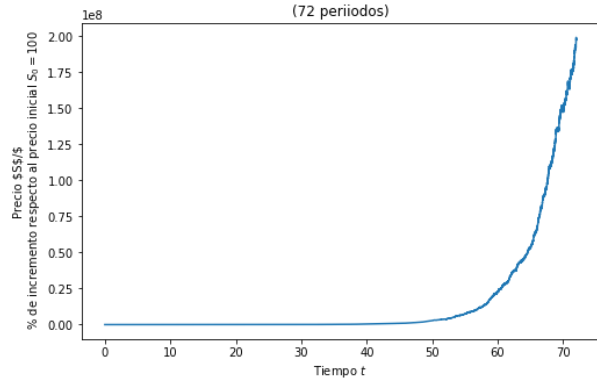
Valor Simulado del precio del Activo (S) con
 $\mu = 0.2, \sigma = 0.05$
 (24 periodos)



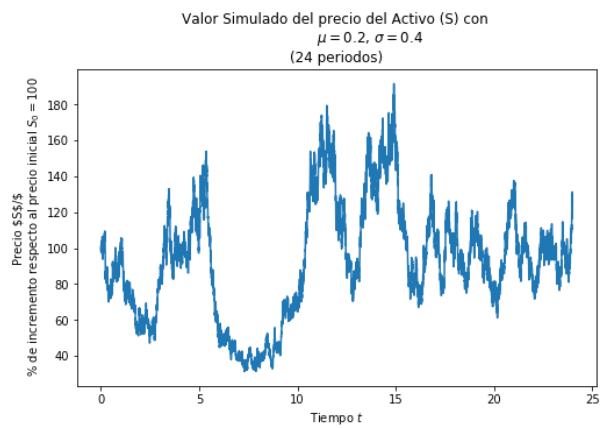
Valor Simulado del precio del Activo (S) con
 $\mu = 0.2, \sigma = 0.05$
 (72 periodos)



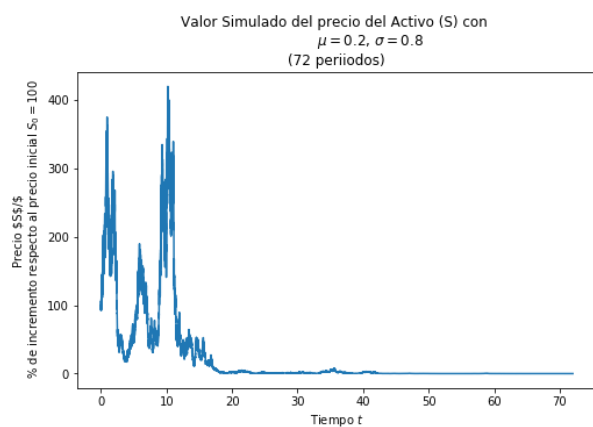
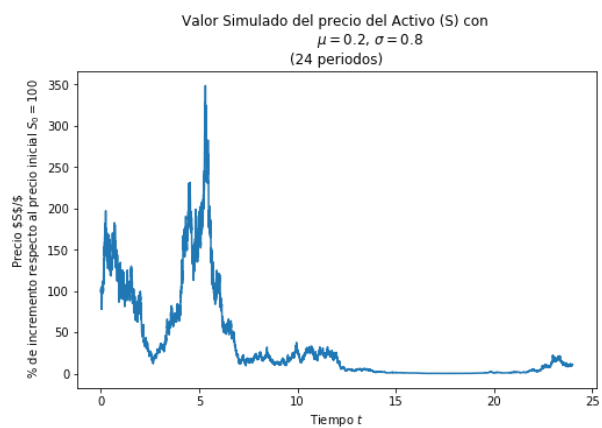
Valor Simulado del precio del Activo (S) con
 $\mu = 0.2, \sigma = 0.05$
 (72 periodos)



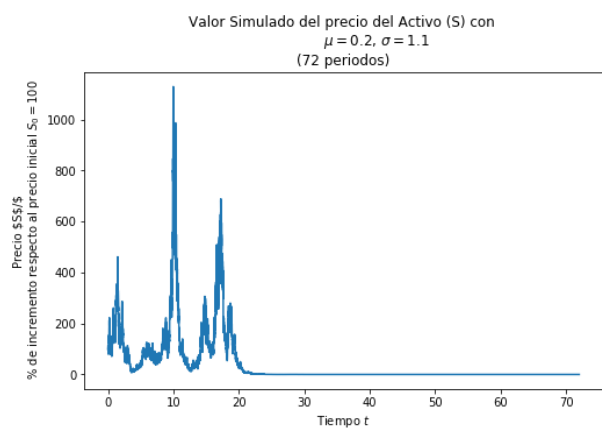
$\sigma = 0.4$



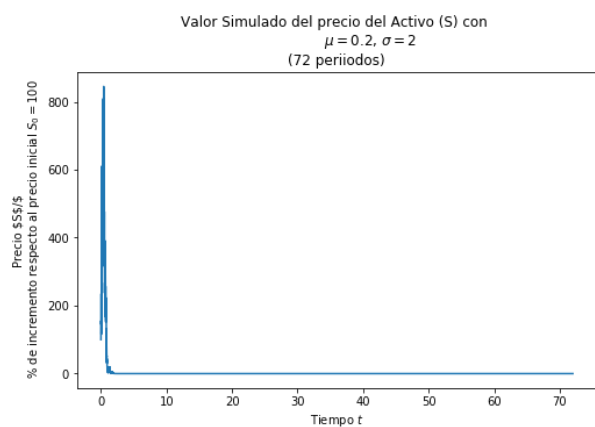
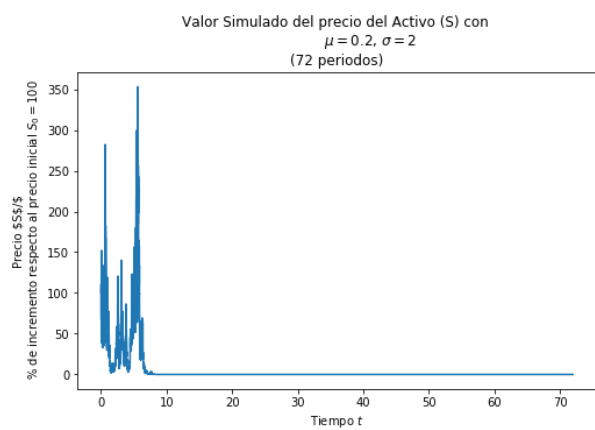
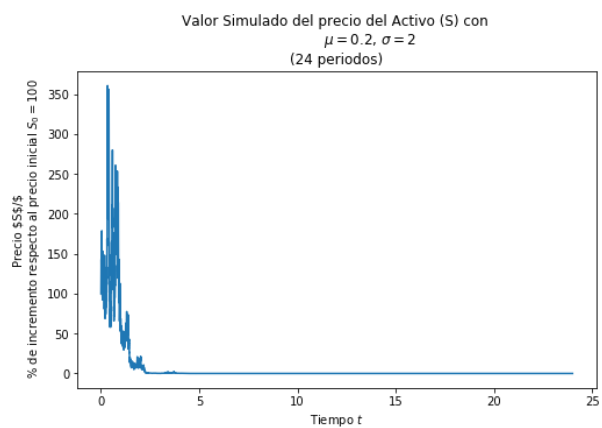
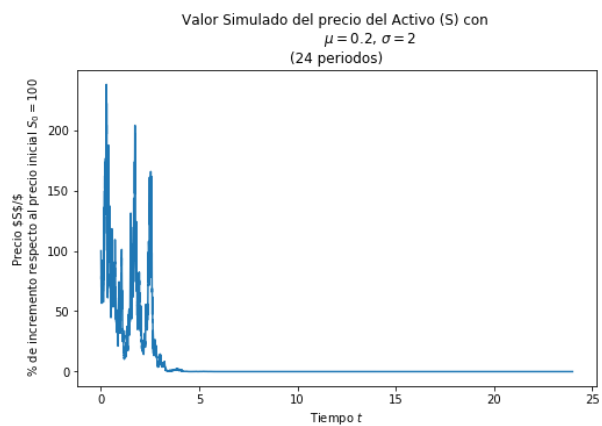
$\sigma = 0.8$



$\sigma = 1.1$

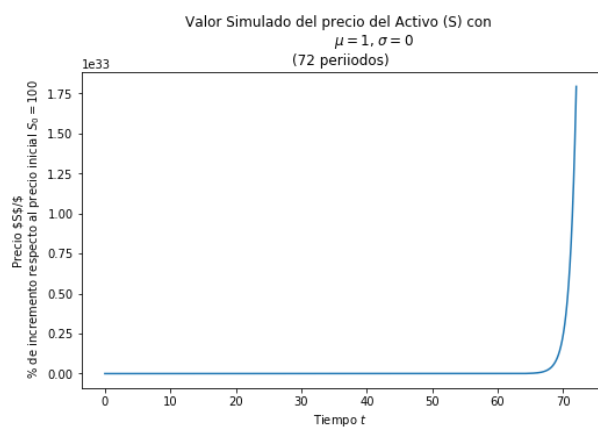
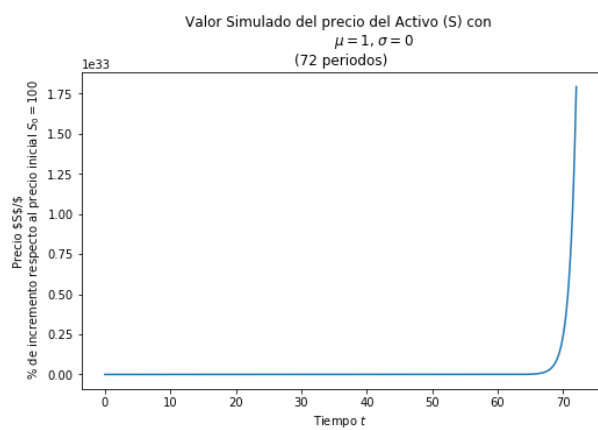
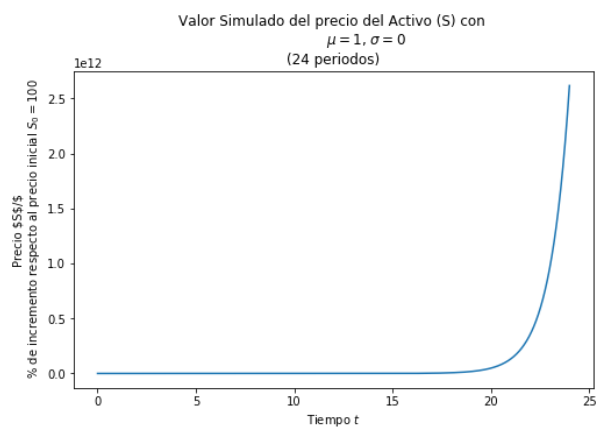
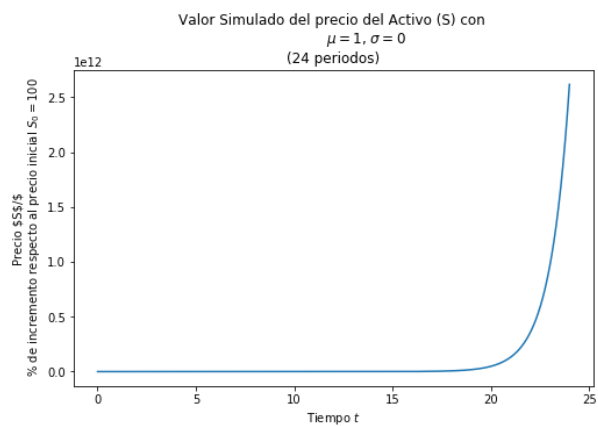


$\sigma = 2$

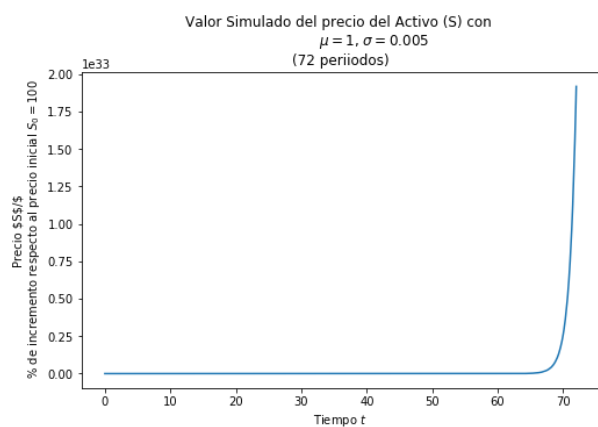
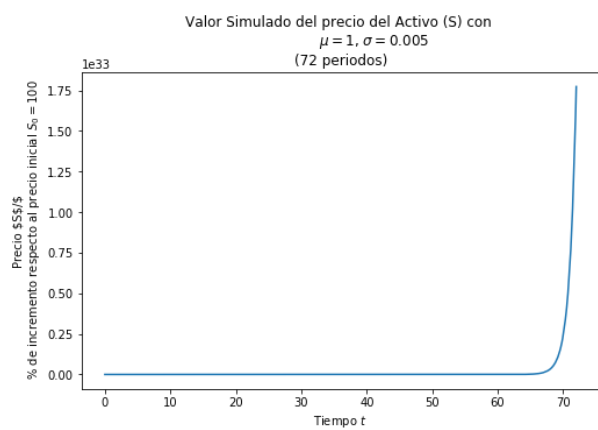
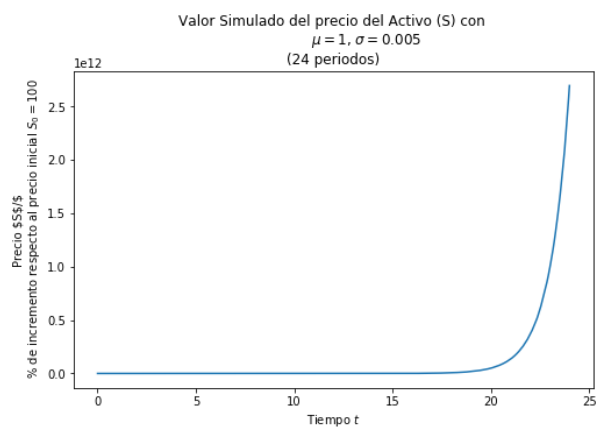
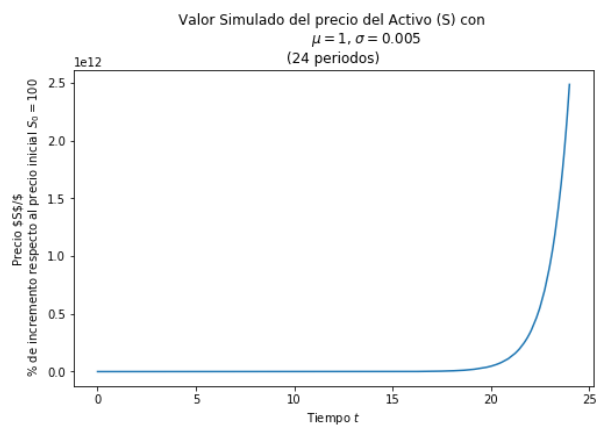


$$\mu = 1$$

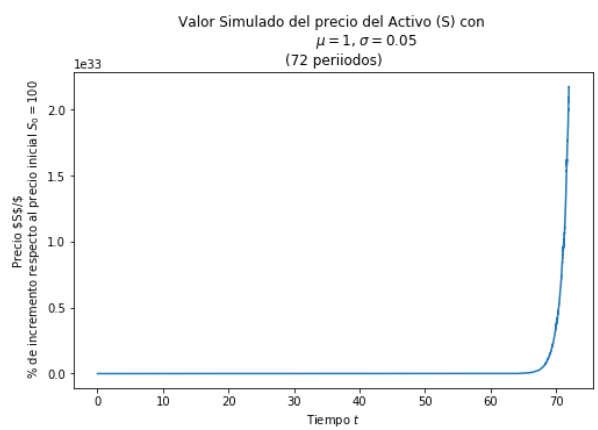
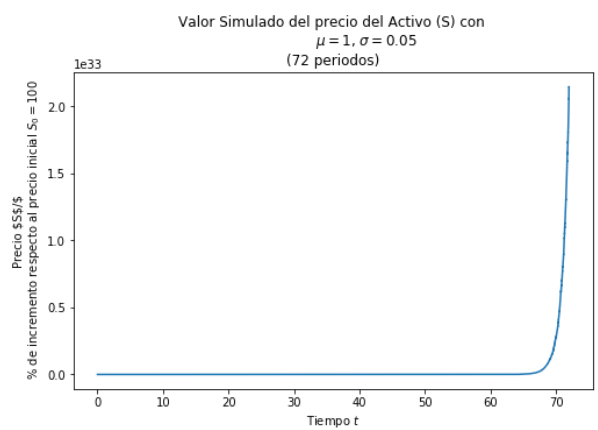
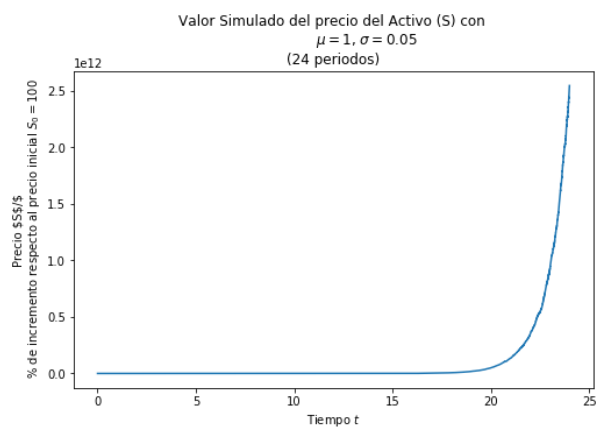
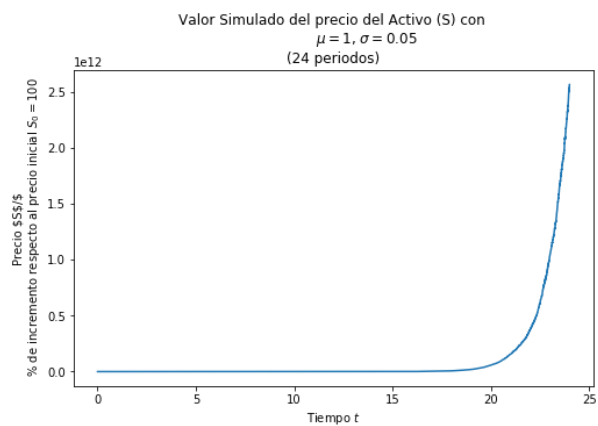
$$\sigma = 0$$



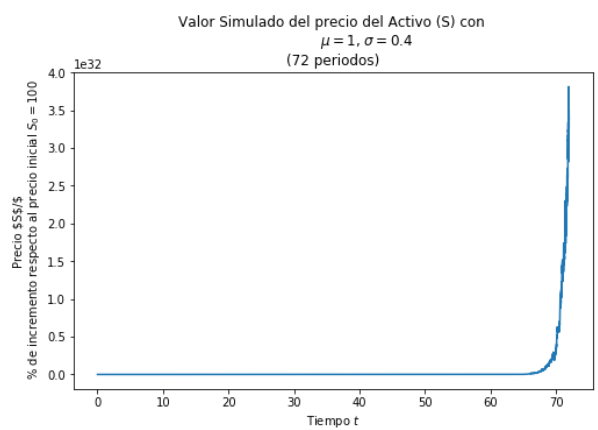
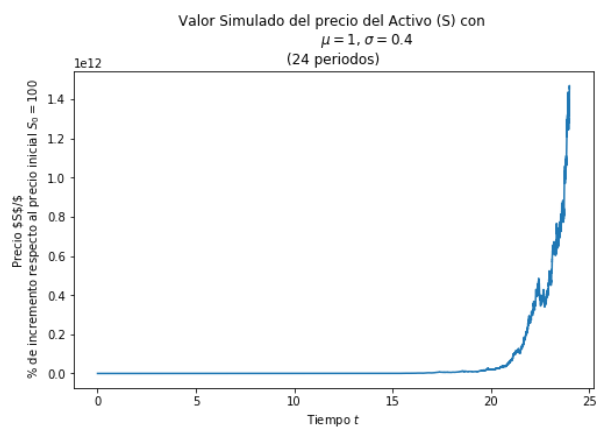
$\sigma = 0.005$



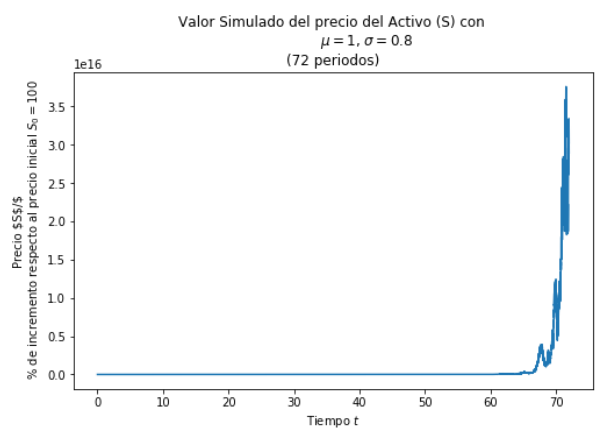
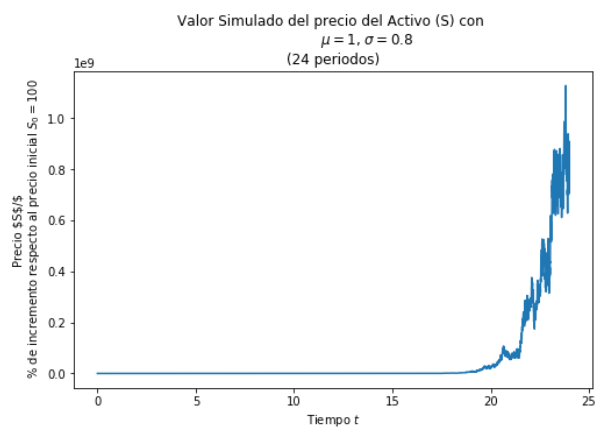
$\sigma = 0.05$



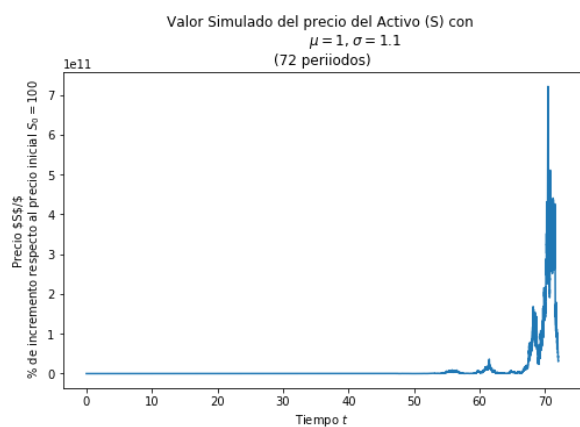
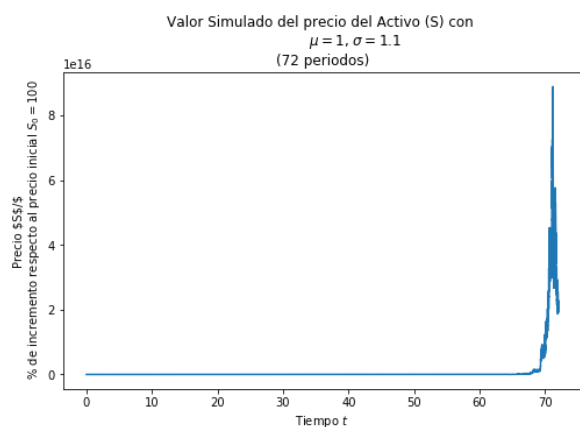
$\sigma = 0.4$



$\sigma = 0.8$



$\sigma = 1.1$



$\sigma = 2$

