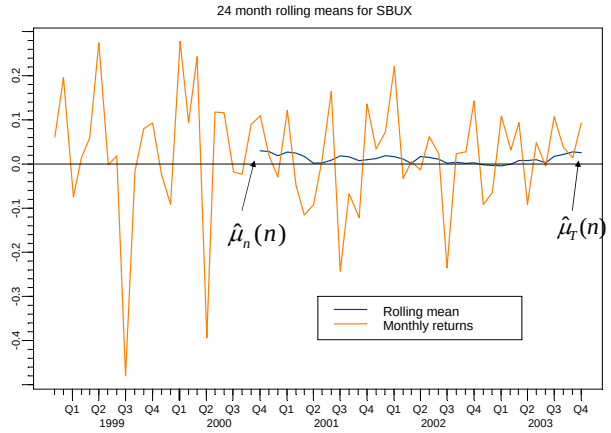
```
# compute rolling means over 24 month windows

> roll.muhat =
aggregateSeries(si.ts[,"sbux"],moving=24,
+                adj=1,FUN=mean)
> class(roll.muhat)
[1] "timeSeries"
> roll.muhat[1:5]
 Positions       sbux
 Oct 2000  0.03009224
 Nov 2000  0.02837211
 Dec 2000  0.01897018
 Jan 2001  0.02713285
 Feb 2001  0.02453311
```

24 month rolling means: n=24

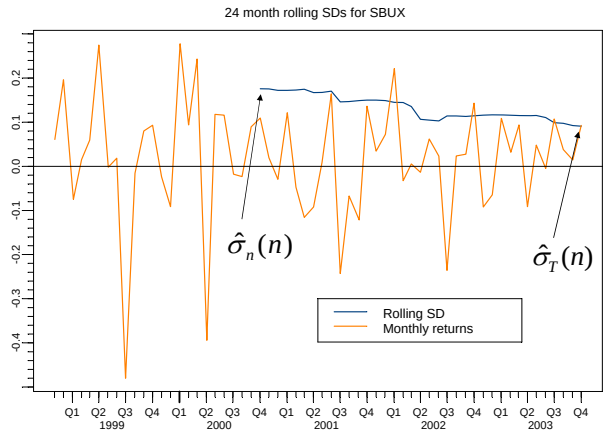


Full sample mean:

```
# compute rolling standard deviations over
# 24 month windows

> roll.sigmahat =
aggregateSeries(si.ts[,"sbux"],moving=24,
+                adj=1,FUN=stdev)
> roll.sigmahat[1:5]
 Positions       sbux
 Oct 2000  0.1755684
 Nov 2000  0.1754568
 Dec 2000  0.1720834
 Jan 2001  0.1720927
 Feb 2001  0.1727502
```

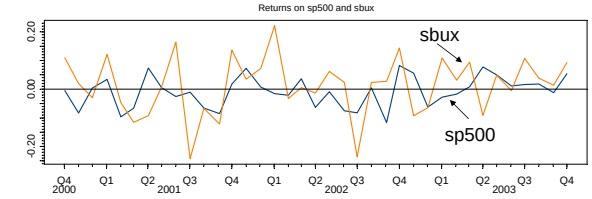
24 month rolling standard deviations: n=24



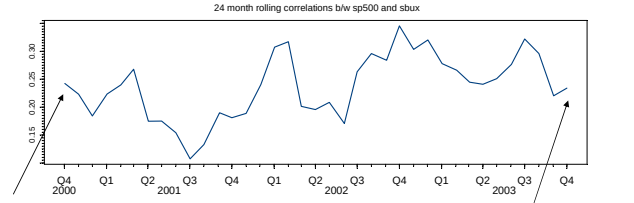
Full sample standard deviation:

```
# function to compute pairwise correlation
rhohat = function(x) {
     cor(x)[1,2]
 }
# compute rolling correlations b/w sp500 and
# sbux
> roll.rhohat =
aggregateSeries(si.ts[,c("sp500","sbux")],
+                moving=24,adj=1,together=T,
+                FUN=rhohat)
> roll.rhohat[1:5]
 Positions          1
 Oct 2000  0.2423265
 Nov 2000  0.2233655
 Dec 2000  0.1842506
 Jan 2001  0.2234648
 Feb 2001  0.2397327
```

24 month rolling correlations: n=24



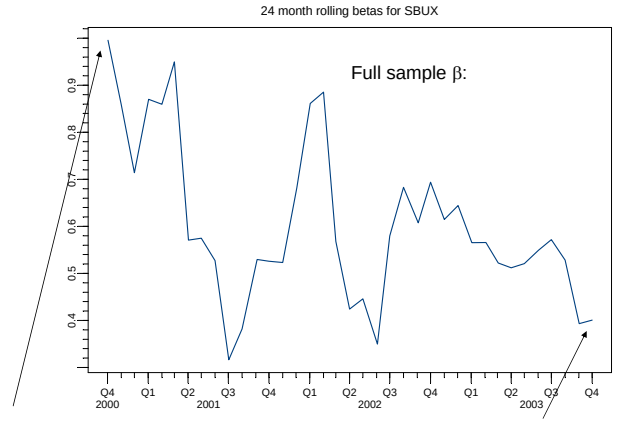
Full sample correlation:



$\hat{\rho}_{sp500,sbux,n}(n)$ $\hat{\rho}_{sp500,sbux,T}(n)$

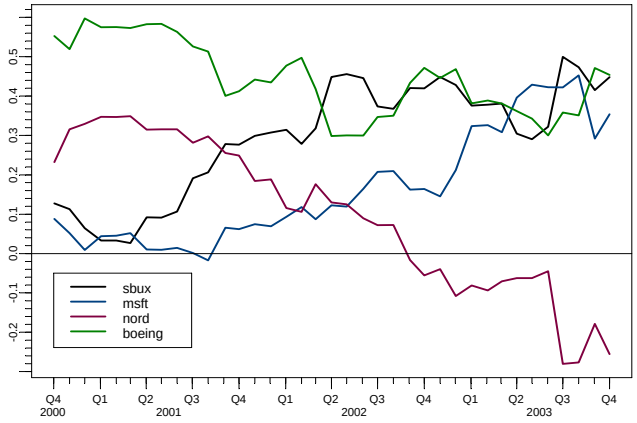
```
# compute rolling estimates of alpha and beta from SI
# model
# use lsfit function instead of lm function
roll.si = function(x) {
     ans = lsfit(x[,2],x[,1])
     ans$coef
}
> roll.fit =
aggregateSeries(si.ts[,c("sbux","sp500")],
+                moving=24,adj=1,together=T,
+                colnames=c("alpha","beta"),
+                FUN=roll.si)
> roll.fit[1:5,]
 Positions      alpha      beta
 Oct 2000  0.01917849 0.9953474
 Nov 2000  0.02399980 0.8583382
 Dec 2000  0.01684467 0.7138994
 Jan 2001  0.02476536 0.8699310
 Feb 2001  0.02448659 0.8592915
```

24 month rolling β's : n=24



$\hat{\beta}_{sbux,n}(n)$ $\hat{\beta}_{sbux,T}(n)$

Rolling global minimum variance portfolio: n=24



Rolling means and standard deviations on global minimum variance portfolio: n=24