

## Tip: October 7, 2016 - Pound Drop

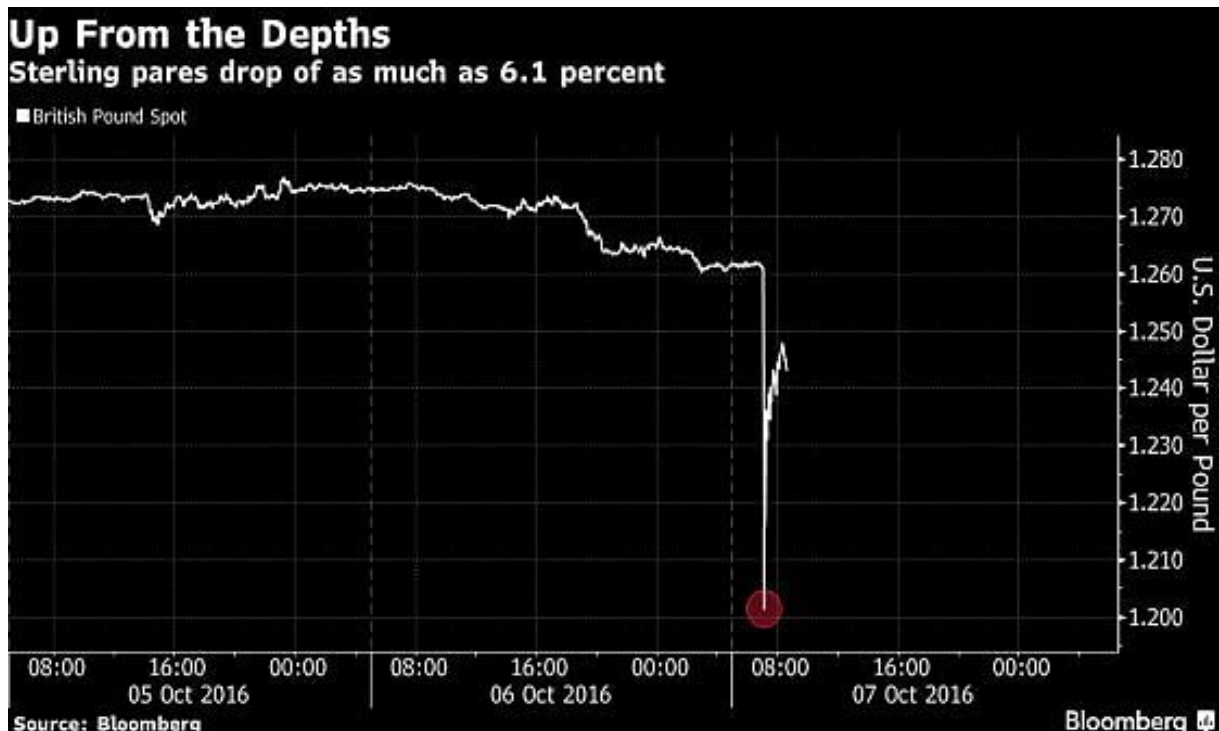
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Students often ask why in a mathematics course for the economy we study piecewise defined functions or, even worse, functions that have an unusual behavior at a particular point of the domain.

The simplest answer to that question is: have a look at financial markets and the performance of stock exchange!

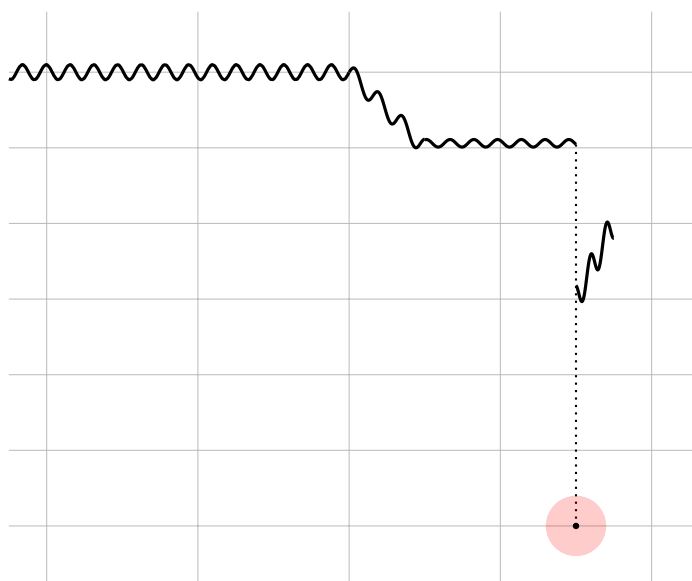
The following picture, from Bloomberg News, shows the change of the pound against the dollar in the morning of October 7, 2016. Between 7 and 8 o'clock, there was a sudden drop down, in about two minutes.



This behaviour, from a mathematical point of view, can only be represented by a piecewise defined function and, in particular, by a function that attains at one point a completely different value from those achieved before and after that point. Such a function has a minimum value at that point that is not related to the values at near points.

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The following figure shows a simple and very rough implementation by means of a mathematical formula of the behaviour shown in Bloomberg's picture.



If someone is interested in experimenting with such a function in geogebra, the code is as follows.

```
f(x) = If[x <= 0, sin(20x) / 10, If[0 < x <= 1, -x + sin(20x) / 8,  
If[1 < x < 3, sin(20x) / 20 - 0.94, If[x == 3, -6,  
If[3 < x < 3.5, 2x - 9 + sin(30x) / 5]]]]]
```