ATM Cost Analysis

Ben Mazzotta

25 September 2014

This paper outlines the variance in ATM costs worldwide. Absent primary data on the cost to maintain ATM fleets in a number of countries, we estimate from secondary sources. The key data sources present in this report are:

- Number of ATMs in each country.
- Maintenance cost of an ATM.
- Cost of funds in the ATM.
- Capital expense for the ATM itself.

The following sections treat each cost in turn; followed by an explicit model for how the costs were calculated.

Maintenance costs

```
## Loading required package: ggplot2
## Loading required package: data.table
```

```
## [1] "atmcap"           "eurointerest"    "eurozone"
## [4] "intrate"          "intratebycountry" "metadata"
## [7] "pop"              "pppconv"          "ppplevel"
```

```
##      Country.Code Country.Name ATMper100k population      ATMs
##   1:          ABW        Aruba   115.8796     102048    118.25
##   2:          AFG  Afghanistan     0.6198   29117538    180.48
##   3:          AGO       Angola    15.7307   20189681   3175.98
##   4:          ALB      Albania    32.5179    2829123    919.97
##   5:          AND      Andorra        NaN      78402       NaN
##  ---
## 254:          WSM        Samoa    26.9822     187485     50.59
## 255:          YEM  Yemen, Rep.     3.7464   23311326    873.34
## 256:          ZAF South Africa    58.6913   51591046  30279.46
## 257:          ZMB       Zambia     7.5777   13657910   1034.96
## 258:          ZWE     Zimbabwe     4.7241   13439720    634.90
```

```
##    Country.Code         Country.Name    ATMper100k        population
##  ABW    :  1   Afghanistan   :  1   Min.   :  0.03   Min.   :9.84e+03
##  AFG    :  1   Albania       :  1   1st Qu.:  9.31   1st Qu.:1.33e+06
##  AGO    :  1   Algeria       :  1   Median : 30.75   Median :8.41e+06
##  ALB    :  1   American Samoa:  1   Mean   : 42.39   Mean   :1.95e+08
##  AND    :  1   Andean Region :  1   3rd Qu.: 58.19   3rd Qu.:3.81e+07
##  ANR    :  1   Andorra       :  1   Max.   :274.54   Max.   :6.96e+09
##  (Other):252   (Other)       :252   NA's   :50       NA's   :11
##       ATMs
##  Min.   :      2
##  1st Qu.:    404
##  Median :   2067
```

```
##  Mean    :  73763
##  3rd Qu.:  16919
##  Max.    :2199554
##  NA's    :50
```

Cost of funds

hello

Capital expense

hello

Model

ATM average monthly costs in the United States, c_ω can be decomposed into the maintenance costs, c_m, cost of funds, c_f, and capital expense, c_k.

$$c_\omega = c_m + c_i + c_k$$

Those cost shares are calibrated using a 2006 Dove Consulting study, reported by the Texas chapter of the American Bankers Association in 2011.

Item	Share
Operating expense	75.3%
Cost of funds	6.3%
Depreciation	18.4%

Operating expenses are assumed to be proportional to the price level in each country. The components of maintenance include labor, telecommunications, back office processing, rent and vehicle costs. In short, they are a broad basket of goods and services unlikely to correlate with any specific price index such as headline inflation. Instead we choose the ratio of PPP exchange rates to market exchange rates. The World Bank indicator `Price level ratio` is available here.[1]

Ben Mazzotta is a postdoc at the Institute for Business in the Global Context (IBGC).

---

[1]World Bank. World Development Indicators. Available at http://data.worldbank.org/indicator/PA.NUS.PPPC.RF