

## 1. Introduction

### Problem

P&G has a process for estimating market sizes using market measurement data and forecasting models. BUT this does not cover Small Emerging Countries (e.g. Nepal, Sri Lanka, Cambodia, etc), as these countries have little or incomplete market information.

### Objectives

Develop a model for estimating market sizes of various products in Small Emerging Markets based on:

- Absolute market size
- Growth for next 5 years
- Associated Risks



## 2. Methodology

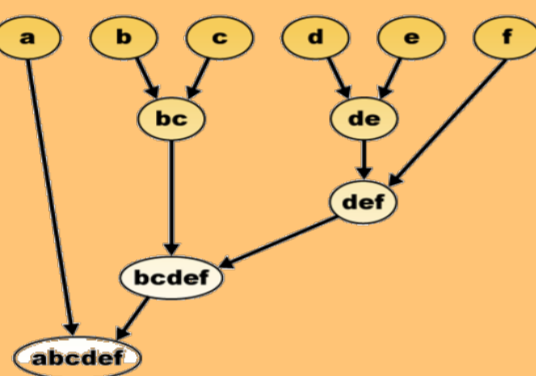
### Clustering

#### Why?

- Overcome problem of lack of data points for regression
- Provides a means of segmentation of countries with available data into market behavior
- Group target markets into one of the defined segments

#### How?

- Used Economic and Demographic factors which would determine market behavior
- Employed Hierarchical Wards' cluster analysis: At each step, the similarities between countries/country groups are compared



#### Challenges:

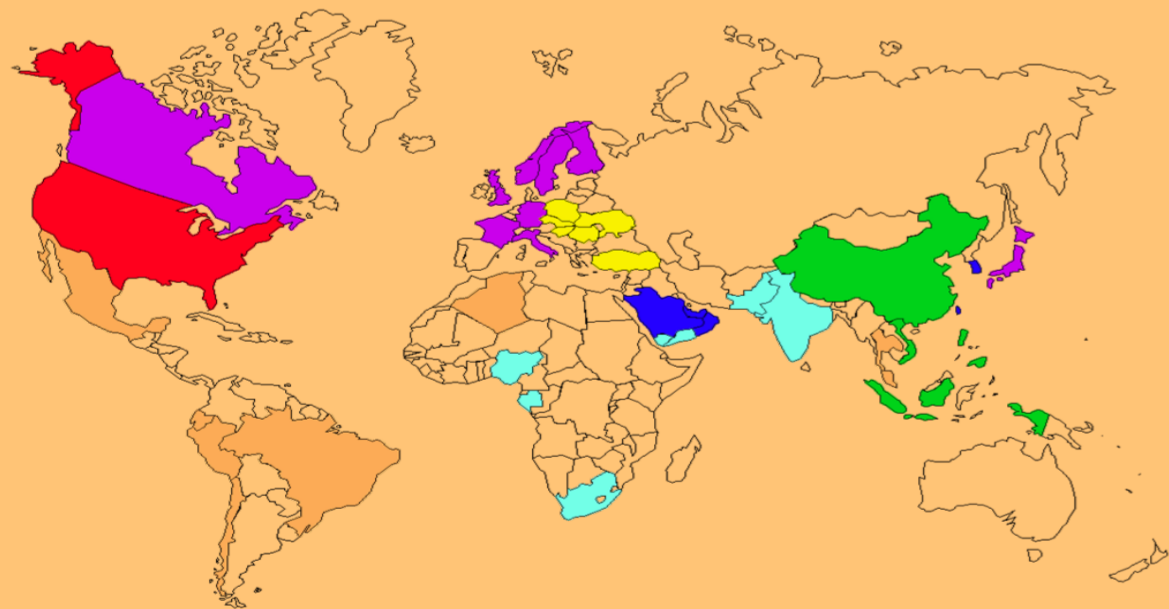
1. Some clusters are too big

Extracted the individual clusters and re-did cluster analysis

2. Some clusters are mathematically sensible but not logically sensible

Used literature review as a basis to make adjustments

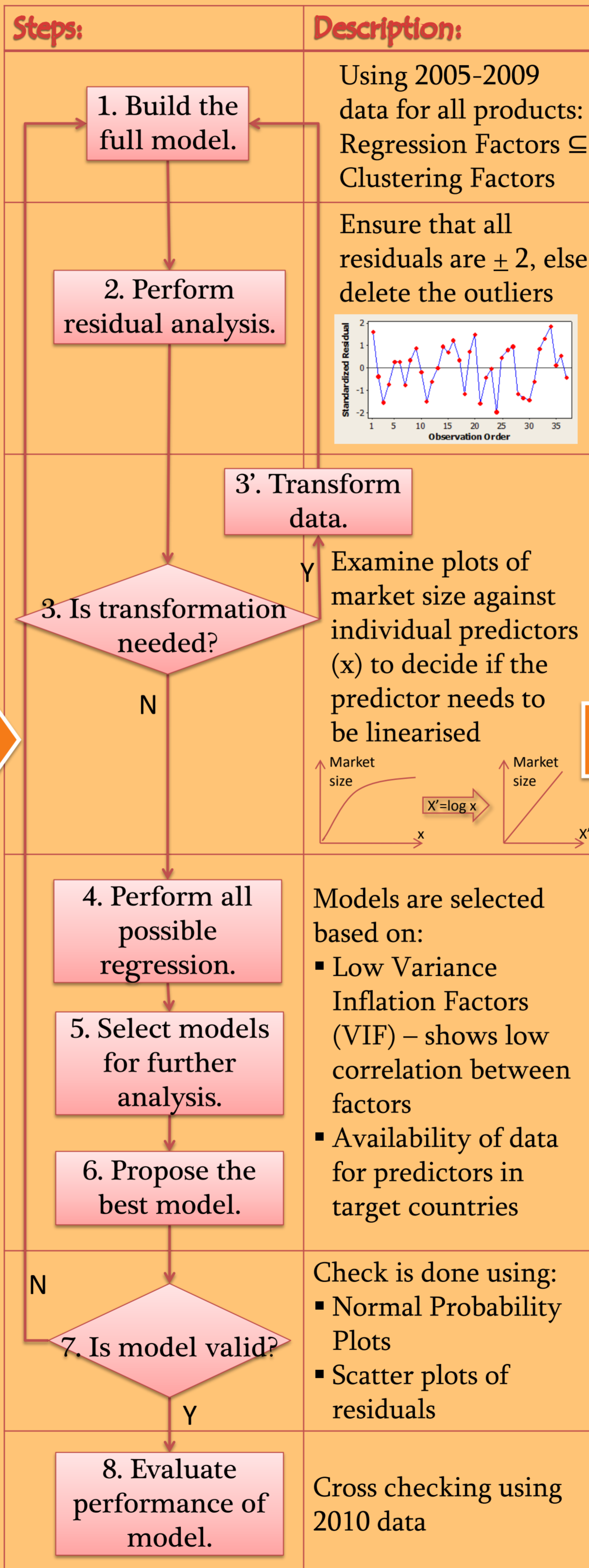
#### Results (7 clusters as shown):



#### Fitting of Small Emerging Markets:

- Using cluster analysis, for countries with available data
- Using literature review and logical reasoning, for countries with unavailable data

### Regression



### Forecasting

#### Estimated market sizes for target markets:

Using the regression models, absolute market sizes of Small Emerging Markets in years 2005-2010 were successfully estimated.

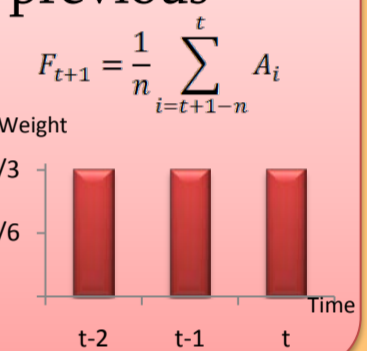
#### Prediction of Growth for next 5 years:

##### Forecasting Methods

##### Simple Moving Average

Forecast  $F_{t+1}$  is the average of n previous observations ( $A_t$ ). Used n=3:

- Only 6 past data points available
- Enable forecasts to be more responsive to recent changes



##### Weighted Moving Average

Similar to Simple Moving Average, but more weight is assigned to the most recent observations.

$$F_{t+1} = \sum_{i=t+1-n}^t w_i A_i ; \sum_{i=t+1-n}^t w_i = 1$$

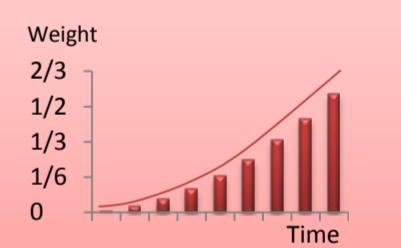


##### Simple Exponential Smoothing

Forecast  $F_{t+1}$  uses all t previous observations.  $\alpha$  chosen to optimize ARIMA(0,1,1), assuming there is no trend.

Decreasing weight is given to older observations.

$$F_{t+1} = F_t + \alpha(A_t - F_t)$$



##### Double Exponential Smoothing

Forecast  $F_{t+1}$  uses all t previous observations.  $\alpha$  and  $\beta$  chosen to optimize ARIMA(0,2,2), assuming there is a trend.

Forecast of base:  $B_t = \alpha A_t + (1 - \alpha)(B_{t-1} + T_{t-1})$

Forecast of trend:  $T_t = \beta(B_t - B_{t-1}) + (1 - \beta)T_{t-1}$

$$F_{t+1} = B_t + T_t$$

#### Associated Risks :

Error range is calculated using a 95% Confidence Interval

Evaluated each forecast based on Mean Absolute Deviation & Mean Square Error to recommend the best forecast technique for each product

## 3. Conclusion

### Summary

Using the methods shown above, we have identified quantitatively the market potential and growth of the target Small Emerging Markets, in terms of size & volume.

At what point does entry into a country make sense?

What is P&G's opportunity in the targeted markets?

### Recommendations

For each of the targeted markets, we analyzed the point of entry and opportunity in terms of the 4 factors – Market Size, Economic Conditions, Competitive Pressures & Regulatory Forces. P&G has to identify the value of market size which ensures that entry into a market is justified and much would depend on the inflationary or recessionary state of the economy, which directly impacts customer spending. Knowledge of competitive pressures would enable P&G to determine potential market share, while the political climate and trade barriers determine the ease of entry.