

Modelling Market Opportunities for Telecommunications in the 21st Century

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ABSTRACT

The previously secure position enjoyed by established telecom operators is currently being threatened by the liberalisation of their markets. Competition now comes from a range of network and service providers. It is therefore important for telecoms operators to be able to model possible threats and opportunities and so plan their market strategies.

This paper analyses one of the biggest challenges currently facing established fixed line telecoms operators; namely how to measure, and hopefully reduce, the number of customers that might cease their fixed line service in preference for using a mobile phone for all their telecommunications. Parameters examined include call-cost tariffs and usage patterns.

As their market share for voice calls decreases, fixed networks need to compensate by encouraging the telecoms market for other services to grow. This paper assesses the delicate balance between tariffs, services, and the resultant customer base obtained by fixed-network and mobile operators. In this way, fixed network operators can begin to understand how customer numbers and revenue generation for other services must be increased to at least compensate for this loss.

A Systems Dynamics model has been created which acts as a powerful scenario simulator. The model itself is described and results are discussed. Although the analysis considers the balance between the fixed network and the mobile phone markets, the systems thinking technique is generic. This technique can be reapplied to other types of competition, such as that offered by Internet Service Providers.

1 INTRODUCTION

With the ever increasing rate of change of the products and services provided in the telecommunications arena, it is beneficial for a service provider to view how these changes may affect the size and value of its consumer base. This knowledge is imperative when allocating company resources to best support and maintain these consumers, at the same time as actively encouraging new users, and increasing profitability.

In particular, the telecoms operator needs to understand the delicate balance between the costs incurred by the customer, the demand for services and churn. Residential customers are particularly sensitive to price, so varying the tariff structure is one very strong way of influencing customer demand. It can be used to grow or restrict a particular market according to a company's ability to service that market. However, it can be difficult to holistically appreciate how the changes to one market sector would affect another.

As one way of responding to this position, a *generic* Systems Dynamics model, using the 'Powersim' tool, has been constructed. This allows the dynamic effects of tariffing, market demand and most importantly, *product substitution* to be assessed.

2 DESCRIPTION OF MODEL

In this paper, we shall consider the *product substitution* between mobile and fixed telephony. It is possible that as mobile tariffs continue to fall, some customers will cease their fixed line, in favour of only using a mobile phone, (mobile-only).

We shall consider a fictional metropolitan community with a fixed population of 1 million customers. The market has been separated into two different types of phone users: fixed+mobile¹ and mobile only². The nature and size of the market groups that have been used within the model are:

Students (12%)
Young Professionals (15%)
Young Families (41%)
Teen Families (8%)
Middle-Aged Couples (14%)
Senior Citizens (10%).

Fictional *average* tariffs of ECUs per minute have been used for each of the fixed and mobile service offerings. These tariffs are different for each market segment to reflect their different patterns of usage.

In an attempt to replicate many of the dynamic factors that a strategist or market forecaster would want to vary, different factors were set up as variables within the model. These can be changed or flexed to assess their elasticity within the market place. For example, the proportion of fixed to mobile calls has been varied for each of the market segments to reflect different types of use. For example, in the scenarios explored in this paper, Young Professionals are deemed to make twice as many mobile calls as fixed whilst senior citizens use fixed lines fifty times more than mobile.

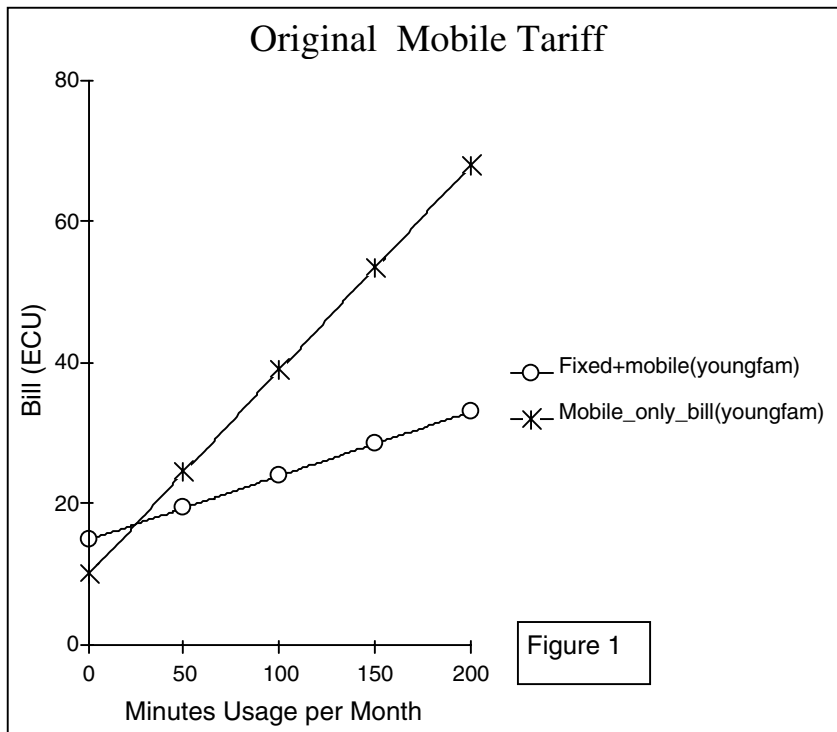
This paper concentrates on flexing just one of these variables, namely tariffing, and the impact this has on the numbers of customers for fixed+mobile and mobile-only.

¹ Customers with fixed and mobile telephony are specified as definitely subscribing to fixed telephony. They may or may not also subscribe to mobile services.

² Mobile-only customers definitely have mobile telephony and do not have fixed telephony.

3 EXAMPLES OF THE OUTPUTS FROM THE MODEL

As an example, let us consider the Young Families segment and determine which of the Fixed+mobile or Mobile-only options is the least expensive, according to the amount of time they use telephony per month.



The graph in Figure 1 depicts the size of the telephony bill for a particular customer segment, (in this case Young Families), versus the total average minutes telephony per month for customers in this segment. If all the usage currently on fixed+mobile telephony is switched to mobile-only telephony then the equivalent bill is illustrated by the "Mobile_only_bill" in this graph.

As can be seen from the graph, using the fictitious tariffs for these services, the Mobile-only service would only be better for them on a cost basis as long as usage remained below 25 minutes a month.

Consider next, Figure 2, which illustrates the effects on the relative bills for Young Families created by reducing the Mobile tariffs per minute by 20%, whilst leaving Fixed and Mobile rentals and the Fixed tariff per minute all unchanged.

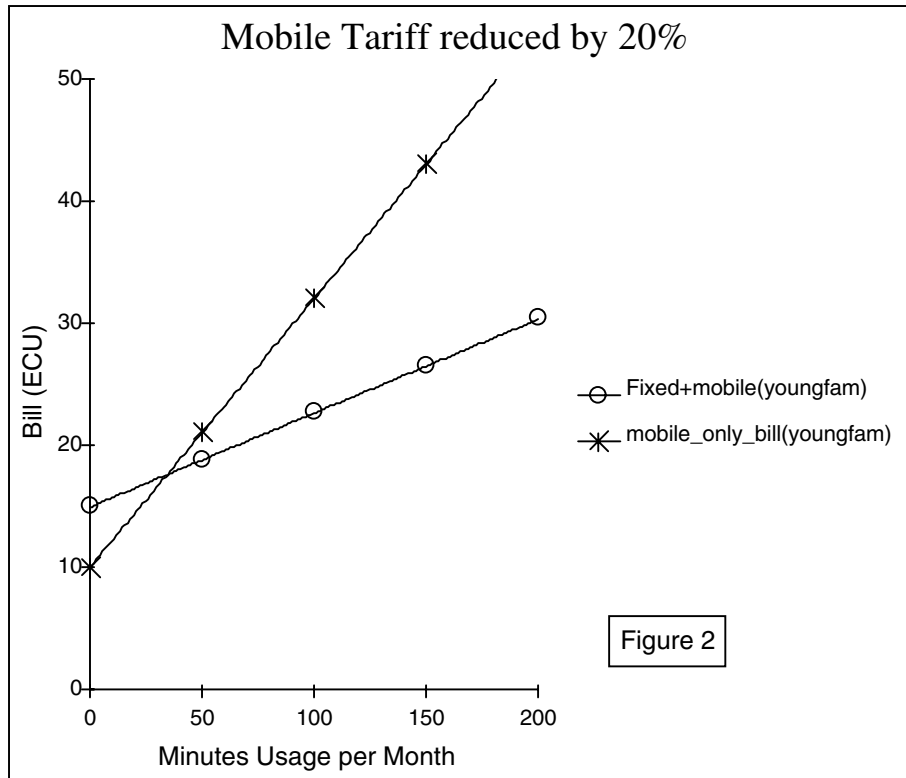


Figure 2

Reducing mobile tariffs by 20% extends the crossover point, at which using mobile-only telephony is cheaper than combined fixed+mobile telephony, to 35 minutes. Once the usage increases beyond this, then the extra charge incurred by having to pay two separate line rental charges becomes negligent in terms of the high call costs of mobile phones.

Unless young families make minimal use of the phone i.e. only just over a minute a day, even with 20% discount they are better off having both a fixed and mobile package and paying the two rental fees.

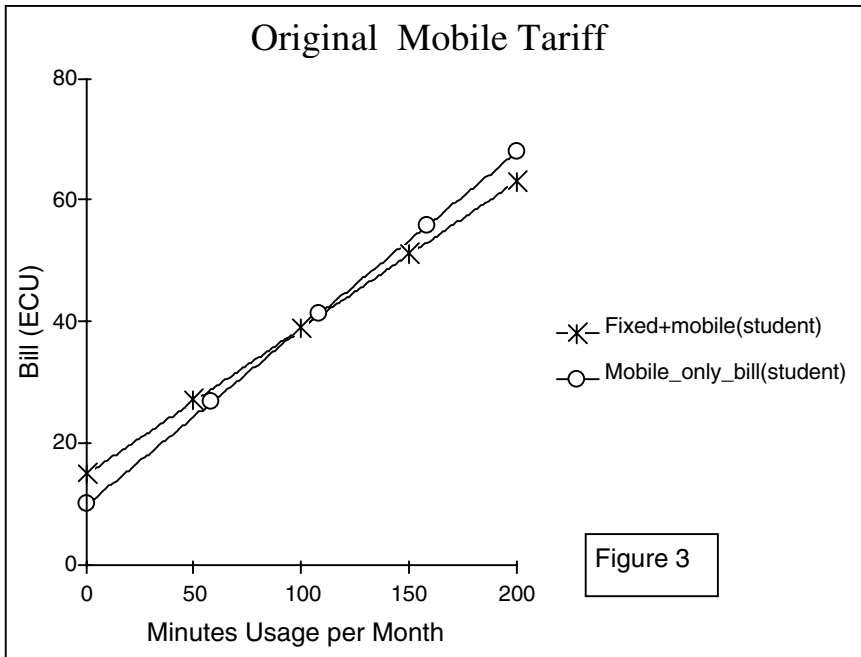
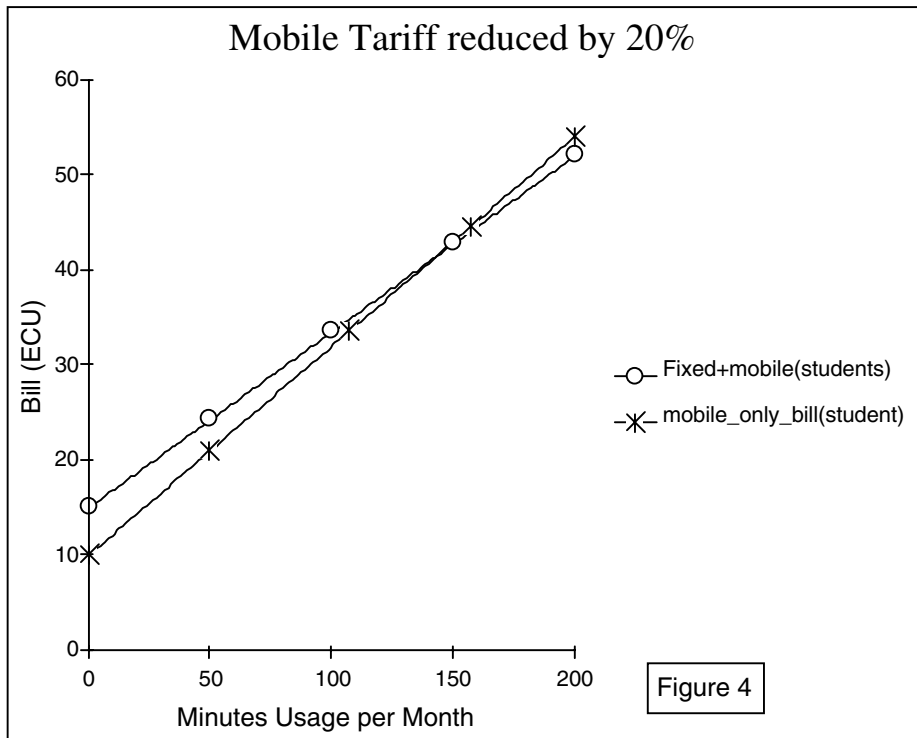


Figure 3

Now let us compare the effect of tariffs on Young Families bills with the effects on the bills of a different customer segment. Consider, for example, Students. Figure 3 shows the combined effects of the original mobile tariffing scheme, (as used in Figure 1 for Young Families), together with the usage pattern for Students.

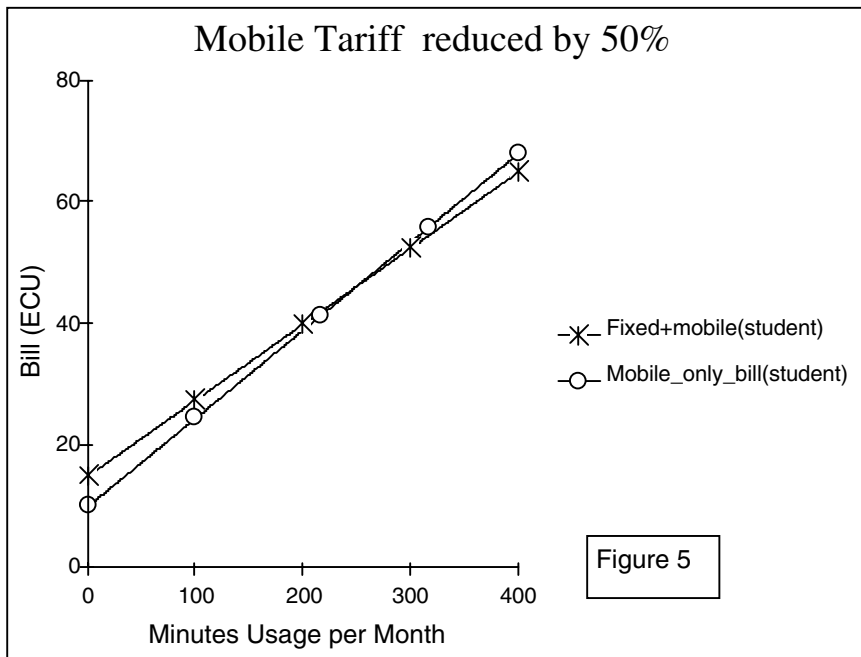
The crossover point for students is four times higher at 100 minutes per month, (compared to 25 minutes for Young Families). Below this 100 minutes point, students would benefit from mobile only, above this point it would be cheaper for them to use Fixed+mobile. However, the gradients of both lines for students are very similar making the decision to go for one option compared to the other not an obvious one, based on cost alone.

Consider now the effects of reducing the tariffs by 20%, as shown in Figure 4.



With the 20% reduction in mobile usage tariffs, the crossover point is moved out to 150 minutes. This is still below the average phone usage of 6 minutes a day for the general population. Again the gradients are similar making it not too drastic an error in terms of cost, if the student chooses the least cost-effective option. Consequently, for students the choice between Fixed+mobile or Mobile-only, based purely on tariffs is not obvious for the scenarios illustrated.

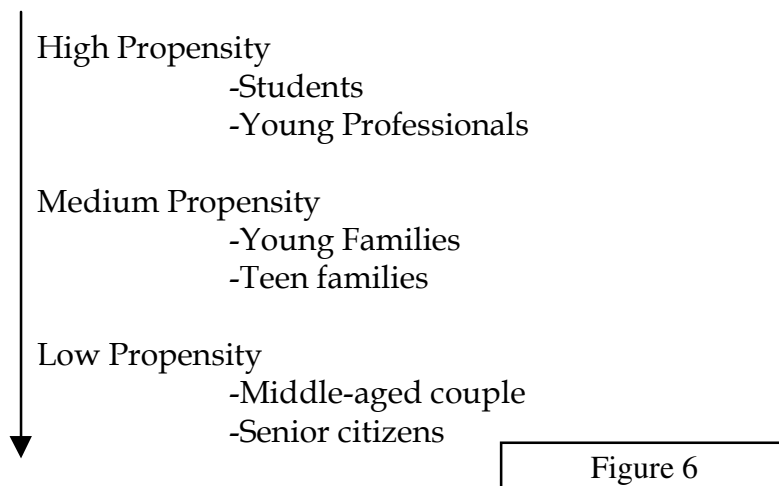
Now consider the effects of reducing the tariffs for Mobile-only by another 30% to give a total reduction of 50%.



The crossover point where Fixed+Mobile becomes cheaper than Mobile-only is pushed out to 250 minutes, making Mobile-only a much more attractive option for students.

4 MARKET THREATS

One of the biggest threats for telco operators today is the churn of customers. However, the opportunities to change are easier than ever. The biggest hurdle for customers to face is often their own lassitude. The model captures this factor by considering the propensity of a customer group to change from Fixed+mobile to Mobile-only on a scale of 0 to 1. Students are considered to be very like to change whilst senior citizens are regarded as being more reticent, as illustrated below in Figure 6.



These propensities can be easily changed if it is desired to flex the scenarios.

The following graphs show the effect of reducing the mobile tariff by 50% on the proportion of the customers, from each market segment, moving from one network option to another. Please note that

the magnitude of the y-axis in Figure 7 is ten times that in Figure 8. Note also that the x axis represents the average usage of telephony for a particular market segment.

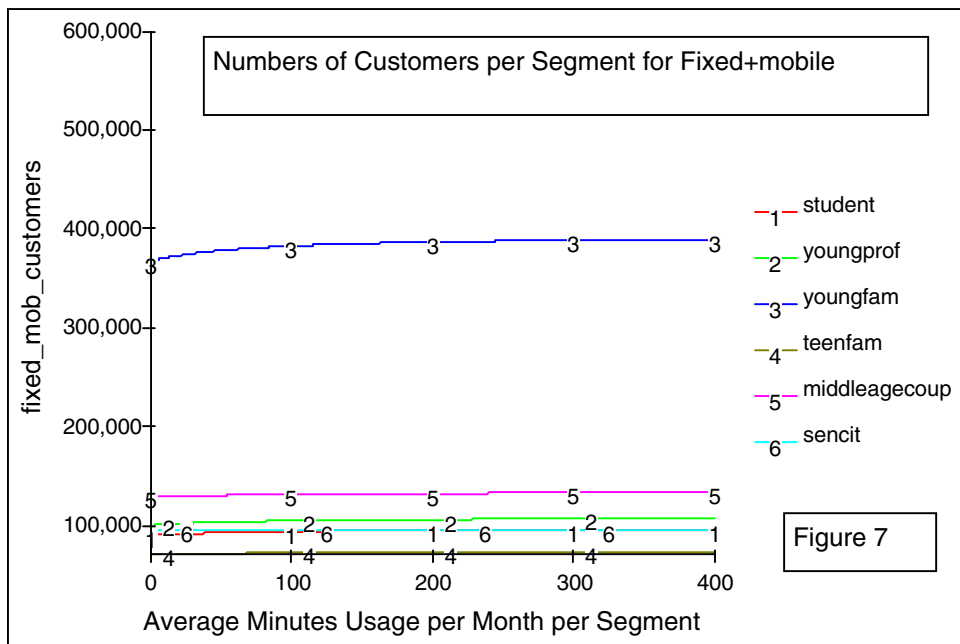


Figure 7

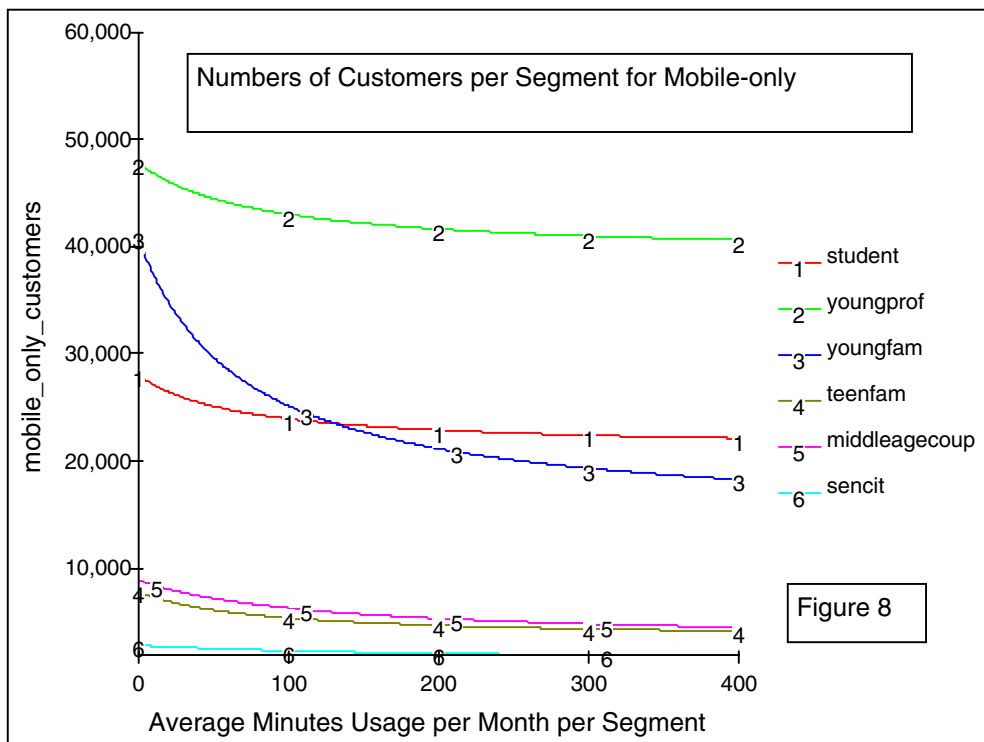


Figure 8

So, for instance, let us suppose that Young Families use 100 minutes of telephony per month. Then, from Figures 7 & 8 about 380, 000 Young Families will subscribe to Fixed+mobile, whereas only about 25,000 will use Mobile-only. Suppose we revise our estimate of the average usage per month for Young Families to 300 minutes. Then the number of Young Families using Mobile-only will have dropped to about 21,000, whereas the number of Fixed+mobile customers in this segment will have increased to about 386,000.

Consider now the general shape of the trends for customers for Fixed+mobile or Mobile-only. For each of the six segments a very small proportion of customers will switch to Mobile-only and then only if their monthly usage is exceptionally low. So, for the scenarios considered, it would seem that Mobile-only is likely to seize just a small market share.

So, even with a 50% reduction in the Mobile tariff, most customers choose Fixed+Mobile as their preferred network, particularly as their monthly usage per month increases. To gain a greater share of the market, Mobile operators need to demonstrate to customers that their tariffs are low and that it is financially beneficial for customers to cease their fixed line.

5 CONCLUSIONS

We have developed a *product substitution* model of which a specific example of mobile replacing fixed telephony has been used. It is possible to flex the tariff scales, the propensity to change, the size of the market and the size of market segment. This means that the model can be used to ascertain at what level of usage it becomes financially beneficial for customers to switch between the two different types of network provision for telephony.

In addition, we have modelled the effects on the market size of each customer segment caused by the change in one tariff-type relative to the other, (here reducing mobile tariffs, whilst keeping fixed tariffs unchanged).

It should be noted most especially that this model is generic and so is not restricted to just Fixed+mobile and Mobile, it can be used for *product substitution* in other markets.

6 ACKNOWLEDGEMENTS

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Footnotes

¹ Customers with fixed and mobile telephony are specified as definitely subscribing to fixed telephony. They may or may not also subscribe to mobile services.

¹ Mobile-only customers definitely have mobile telephony and do not have fixed telephony.