Mormon Church Growth

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The keys of the kingdom of God are committed unto man on the earth, and from thence shall the gospel roll forth unto the ends of the earth, as the stone which is cut out of the mountain without hands shall roll forth, until it has filled the whole earth.

D&C 65:2

This is just laying the foundation; it is a little nucleus, and a few thousands are gathering to it year after year; but the work that is now commenced will increase, and continue to increase, like the stone that was hewn out of the mountain.

Orson Pratt, 1854

Abstract

Sociologist Rodney Stark (1984) predicted that the Church of Jesus Christ of Latter-day Saints would grow at a rate of 30-50% per decade for the next several decades, reaching from 70 million to possibly as high as 280 million members by the year 2080. From 1984 to 2000, the church actually grew at an average rate of 52% per decade, outpacing the upper bound on Stark’s prediction. This has led some people to think that the upper bound of Stark’s 2080 forecast is conservative.

This paper will discuss the nature of exponential growth and the prerequisites that the church must meet to sustain it. It will examine the evidence available for how well the church is meeting those prerequisites and will take a closer look at the church’s growth pattern over the last 25 years. It will argue that the growth rate of the church is decreasing and will probably
continue to decrease in the future, with the total membership of the church never coming close to 280 million.

**Missionaries or Members?**

Stark convincingly argues that religions grow through networks of friends and relatives in an application of the control theory of deviant behavior. "In effect, conversion is not about seeking or embracing an ideology; it is about bringing one’s religious behavior into alignment with that of one’s friends and family members" (1996:16-17). This is certainly an important element of the Mormon's success, and the Mormons know it. Missionaries are taught, "Members of the Church are responsible to prepare their nonmember relatives and friends to hear the missionary discussions. You will teach and baptize much more if you can help members to fulfill this responsibility" (LDS Church 1988:193).

According to the records of a mission president, when missionaries knock on doors making cold calls, a conversion will result one time out of a thousand. However, when missionaries make their first contact with a person in the home of a Mormon friend or relative, a conversion will result 50% of the time. (Stark and Fink 2000:135) Contrary to what some people infer from these statistics, this does not mean that the typical pair of missionaries gets 10 converts per year by encountering 20 non-members in the homes of members any more than it means it gets 10 converts per year by knocking on 10,000 doors (about 30 doors per day). This data only tells us that some missionary activities are more productive than others.

It would be useful to get an idea for how much of the church's growth is due to the efforts of the missionaries, and how much is due to the natural growth of the message spreading across networks of friends and families. One way to do this would be to regress the number of converts every year against the number of members and the number of missionaries. If we were to take this approach, the standard errors would grow with the size of the church leading to a very big heteroscedasticity problem. Another approach would be to regress the percentage growth¹ of the church against the average percentage of members who are serving missions during the year. The constant term would give us the baseline growth, and the beta would tell us how much extra growth comes as a result of the missionary effort.

I couldn't find data on the average number of missionaries serving in any given year, but I did find data on the number of missionaries who began their missions in various years (Deseret News 2000:585). The number of missionaries set apart in any given year would seem to be a reasonable estimator of the amount of aggregate effort the full-time missionaries are exerting. The regression equation is

(1)
Where \( g_t \) is the percentage growth of the church in year \( t \) and \( x_t \) is the number of missionaries set apart in year \( t \) divided by the average number of members in year \( t \). Running this regression on data from years 1860 to 1999, the result of this is

\[
g_t = \beta_0 + \beta_1 x_t + \epsilon_t\]

and

\[
\beta_1 = 2.62\%
\]

This means that irrespective of the number of missionaries in the field, the church can expect to grow at a rate of 2.62% per year (29.5% per decade), and that each missionary that is set apart will contribute an additional 5.78 converts. The church grew at an aggregate rate of 45% per decade over this time period, indicating that the full-time missionary effort is directly responsible for roughly a third of the church's growth.

The results of this regression were statistically significant--the \( t \)-statistic is 3.78. However, \( R^2 \) squared is only 9.4%; the growth rate of the church bounces around from year to year in such a way that only 9.4% of the change can be explained by the number of missionaries set apart in any given year.

**Is the Church Growing Exponentially?**

In 1989 the Church baptized 319,000 converts and grew from 7.3 million members to 7.7 million. Followers of church growth were quite exited about this--it represented a growth rate of over 200% per decade. Over the subsequent 12 years, the number of members and the number of missionaries had each increased by about 70%. To produce exponential growth, the number of converts would also need to increase by 70% over this time period to about 540,000 converts in the year 2001. Disappointingly, the number of converts in 2001 wasn't 70% higher than the 1989 level--it was 8% lower. In each of those 12 years, the church baptized about 300,000 converts. This would indicate that the church is growing in a linear fashion, not an exponential one. In other words, the rate of growth measured against the size of the Church is slowing down. The question this presents is whether (a) the fundamental drivers of church growth are subsiding, or (b) we are witnessing a cyclical--and temporary--downturn in growth, or (c) the underlying growth rate really hasn't changed and this apparent slowdown is merely a manifestation of random fluctuations in the growth rate. This section will demonstrate that the slowdown is not a manifestation of random fluctuation in the annual growth rate.

Assume the function \( g_t \) is of the form

\[
g_t = \beta_0 + \beta_1 x_t + \epsilon_t
\]

Where \( \epsilon_t \) is normally distributed with a constant variance. If the church is growing at a constant exponential rate, then \( \beta_1 \) will be equal to 0. The question is, what are the correct
values of and ?

Table 1 shows 22 years of membership data--from 1980 until now. Table 2 shows the ANOVA for the regression and chart 1 shows the fitted line and the measured delta.

The null-hypothesis is that . This is the scenario where the church is growing at a constant exponential rate of , and the year-to-year variations from that are due to random fluctuations. The F-statistic of 8.06 with 1 and 19 degrees of freedom means that we can reject that hypothesis at the 95% significance level (the critical value is 4.38). In other words, we can be well over 95% certain that the decrease in the church's growth rate over this time period has not been to random chance, but rather to an underlying trend.

The R-squared for the regression is 28.7% which means that 28.7% of the total sum of squares is explained by this regression line. Looking at Chart 1, we see one data point that is very far away from the regression line--1989. That single point is responsible for 63% of total sum of squares. If it weren't for that single point, R-squared would be much higher. In 1989, the church reported that 400,000 converts and children were baptized, and they also reported that the number of members of the church grew by nearly 600,000. The only explanation for this apparent contradiction is the growth associated with those extra 200,000 people were not counted in prior years and were added late in 1989. If the numbers were restated to reflect when those people actually joined the church, the regression line would be a much better fit.

Fundamental Nature of Exponential Growth

In 1998 Dr. Stark revisited his famous 1980 predictions. He reported that his projections received a significant amount of attention from his fellow social scientists and that they gave him "an amazing amount of counseling concerning the pitfalls of straight-line projections" (Duke 1998:22). My purpose here isn't to give general warnings about the dangers inherent in forecasts in general or straight-line projections in particular, but rather to explore the specific implications of exponential growth. If we understand what, specifically, causes exponential growth, we can focus our analysis of growth on the specific antecedents of that growth pattern rather than on generic assumption such as whether or not is some vague way tomorrow will be like today and yesterday.

In the real world many things grow exponentially things such as the number of bacteria in a petri dish, the amount of money in an account that earns compound interest, the size of my friend's Amway business, and of course the Mormon church. Invariably, exponential growth is only a temporary phenomenon. Sooner or later the bacteria run out of food, the money is withdrawn from the account, and the MLM network runs out of contacts. It's imaginable that the Mormon Church will grow at 50% per decade for the next 78 years and will reach 280 million in 2080, but if it were to then continue growing at that rate it would reach 16 billion in 2180 and 921 billion in 2280. At some point, circumstances always force exponential growth to
When making long range forecasts of something that has been growing exponentially, the most important element of the forecast is estimating when the rate of growth will slow down. To do that, it is crucial to understand what internal properties cause it to grow exponentially, and what external environmental factors permit it to grow.

When exponential growth happens for an extended period of time, the internal driver of the growth is a mechanism where *like creates like*. In a savings account, money earns money. The new money that is earned is just as capable of producing more money as the money that created it. Thus the level of the account grows exponentially. When a bacterium in a petri dish splits, it creates two bacteria that have the exact same capacity to reproduce as the parent. Bacteria produce bacteria and the size of the colony grows exponentially. The result is that the new members of the system are homogenous with the old members.

On the other hand consider a hive of honeybees. In the beehive, the queen bee normally produces drones and workers, not queens. The drones and workers do not have the same capacity to reproduce as the queen. The population of the hive is limited to the number of bees that the queen can individually produce, so the number of bees in a hive would not grow exponentially and the members of the system would not be homogenous--as the hive grows ratio of reproducing members to non-reproducing members will go down.

The essential internal characteristic of exponential growth mechanisms is a process where *like creates like*. But what environmental factors are necessary for exponential growth to take place? The key environmental factor is a *relative lack of competition*. The reason why bacteria grow exponentially in a petri dish is because in that environment there is ample food and energy, no other organisms competing for the food and energy, and no predators preying on the bacteria.

The natural world is more complicated and competitive than the world in a petri dish. But exponential growth still occurs. This usually happens when something is filling a particular niche in the evolving ecosystem. A new plant that has a competitive advantage over the native plants might be introduced into a system. Its presence will grow exponentially, displacing native plants. But eventually the niche will be filled and new balance to the system reached. The alien plant will have displaced all of the plants that it was capable of displacing, and no longer be able to find more space with the properties that it needs to survive.

When something grows exponentially for an extended period of time you will always find these internal and external characteristics: It will be self-replicating producer multiplying in an environment where it has a competitive advantage.
**Why is Growth Slowing Down?**

With a clear understanding of the intrinsic implications of exponential growth, we can break aggregate church growth into its component pieces and analyze each piece, paying particular attention to the exponential growth characteristics of each piece. The contribution I am attempting to make in this section isn't to fully explain the growth patterns of the LDS Church, and it isn't to establish the basis for alternative projections. Rather, my purpose is to show how I believe growth patterns should be analyzed and to illuminate what one should see in growth patterns today in order to justify assumptions of exponential growth in the future. I will propose some answers to these questions in relation to the growth of the Mormon Church, but further research is needed to fully explore these issues.

Membership growth can be broken down into two main pieces: growth due to children born into the church and conversions. Growth due to conversions can be further broken down into conversions along the social networks of the general membership of the church and conversions impelled by the efforts of the full-time missionary force. Growth due to all of these factors is offset by decrements due to excommunication, disaffiliation, and death, and they are all affected by the nature of the competitive environment.

**Children**

A few weeks after a child is born to Mormon parents, they have the opportunity to bring the baby to the church to receive a special blessing during the weekly worship service. When the baby is blessed in this manner, the name of the child is recorded by the church, even though he or she won't be an official member of the church until he or she is baptized after turning eight. In 1982 the church had about 5 million members, and 124,000 children were blessed. This represented 2.4 children blessed per every 100 members. Since then, this ratio has steadily fallen until last year where 0.61 children were blessed per 100 members. This means that the 11 million member church of 2001 was able to produce a little over half as many baby blessings as the 5 million member church of 19 years earlier. (See Chart 2)

It's harder than one might expect to fully understand the exact cause of this drop in blessings. Birth rates around the world have gone down over this time period, and Mormon participation in this trend is certainly part of the cause. Another probable cause has to do with the success of the mission program over this time period. As the missionaries have baptized converts, the cultural distribution of Mormonism has moved away from the descendants of pioneers and towards diverse people in diverse locations. Many of these cultures probably have birthrates lower than that of the Mormons of the Inter-mountain West. A third possible cause has to do with the activity rates of members of the Church. When Mormons goes totally inactive, the church will keep their names in the membership totals of the church until they proactively request their names to be removed. When Mormons in this category have children, by definition
they don't bring their children to church to be blessed. Thus when we are calculating the ratio of babies blessed to members of the church, the new children of inactives are not counted in the numerator of the ratio while the inactive parents themselves are counted in the denominator. I don't know how large this group of inactive Mormons is. But if the size of this group is growing, it would cause the ratio under consideration to go down.

Mormons born into the church represent the core of devotees. It is the only religion they have known in their lives--the religion and culture they were raised in. These are the people who are most likely to influence their friends to become Mormons and are the people least likely to be influenced to leave. They are the ones most likely to eventually serve full-time missions where they will gain not only converts for the church but also the expertise to be the next generation of church leadership. And as time goes forward, they are becoming a smaller and smaller component of the church's annual growth. Chart 3 shows that while they represented 40% of new members in the 1970's, they only represent 20% of the new members today.

Of course this in itself doesn't prove that the church can't continue to grow exponentially. It is possible that the converts are better at spreading the gospel than lifetime members; it is possible that this advantage is enough to offset the dramatic decrease in the percentage of people being born into the church. Whether or not that is the case is a question best left for future research. My point here is to suggest that the church of today is not homogenous with the church of the recent past. This represents a dramatic shift in the basis of the Mormon population, and may prove to have a dramatic effect in the way the Church grows.

Converts

I demonstrated above that the number of missionaries serving in a particular year is an important indicator of the church's growth--when there are fewer missionaries serving the church grows slower. When there are more missionaries, the church grows faster. This doesn't contradict the theory that religions spread along social networks. The Church is acutely aware that conversion is a process of bringing one's religion into alignment with that of your friends. That is why missionaries are taught that a key to their success as a missionary is to have a good, spiritual relationship with the potential convert that is more than a casual friendship (LDS Church 1988:216), and why they work to establish relationships between the convert and the local congregation as the conversion progresses (LDS Church 1988:239). A potential problem is that as soon as the strong relationship between a new member and a particular missionary begins to show the fruits of conversion, that missionary is transferred to a different area before other relationships in the congregation are established.

Over the last 30 years, the percentage of members serving missions has remained constant. This is a very important requirement for sustained exponential growth. However, the percentage of converts these members and missionaries have been producing has been going
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steadily down over the last 12 years. I don't know if this slowdown should be attributed to the effectiveness of the missionaries, the effectiveness of the members, or to the environment in which they grow. Some people have suggested that the church purposefully grows in spurts and that the missionaries are currently focusing on developing current members from the last growth spurt rather than on acquiring new ones. But it seems doubtful that the Church is deliberately taking this strategy at this time. In a satellite broadcast in February of 1998, President Hinckley challenged the Church to increase baptisms by saying, "With concerted effort, with recognition of the duty that falls upon each of us as members of the Church, and with sincere prayer to the Lord for help, we could double the number of convert baptisms" (Stucki 1999) While an increase in convert baptisms of 100% was the goal, the actual number of baptisms actually fell by 6% that year.

Other Internal Factors

In Acts of Faith, Stark and Finke propose that as churches grow, they tend to shift from higher tension to lower tension, and that shifting will initially help its growth but if it continues, it will eventually hurt growth. As the Mormon faith has evolved over time, its tension with its environment may have changed. It is worth researching whether the tension has in fact changed, and whether it can help explain growth patterns.

From 1880 to 1978, the church grew at an average rate of about 40% per decade. That is the year when the offer of the priesthood was extended to everyone without regard to race. It was about that time that the growth rate jumped up to nearly 70% per decade until the early 1990's. In the 1990's, the Church has put a greater emphasis their basic belief in Christ and has distanced itself from higher-tension doctrines such as the belief that God was once a man and polygamy. It is worth further research to try and determine if these changes have caused a shift in the amount of tension that the Church offers, which may have made it less appealing to potential converts, and has resulted in the growth rates falling below 40% per decade.

External Factors

A major change in the world that occurred in the 1990's was the proliferation if the Internet. People prone to the Secularization theory might believe that now that the masses have the Internet, delivery from the bonds of religion is nigh at hand. Could it be that the proliferation of the Internet is the reason why the growth of the Church has slowed down during the 90's?

In 1995, 6.7% of Americans were on the Internet. That percentage exploded to nearly 60% by the end of 2000. I ran regressions on the slowdown of Church growth against the percentage of
people in American and in the world who are on the Internet. The proliferation of the Internet doesn't appear to be a significant factor of the declining church growth in the 90's--the slowdown in growth started before most people had even heard of the Internet, and the slowdown did not accelerate when the popularity of the Internet mushroomed.

Another external factor has to do with competition among different churches. Only a fraction of the population is interested in strict religions, and Mormonism finds itself competing with faiths such as Pentecostal Christianity, Assemblies of God, and Seventh-day Adventists. Since its birth in 1901, Pentecostal Christianity has grown to 450 million believers, including 150 million in Africa alone. The Assemblies of God (Religion Today: 2000) and Seventh-day Adventists (Adventist News Network: 2000) have a combined membership of about 50 million, and both faiths are currently growing at rates of about 250% per decade.

The success of these other churches is relevant to our study of Mormon growth for two reasons. First, it is relevant because these are the Mormons' competitors in the market of strict, Christian oriented religions. The market is of limited size, and any one of these religions won't be able to keep growing exponentially without cutting into the growth projections and membership of the others. This level of competition will likely put a damper on the growth of all of these churches. Exponential growth occurs in systems where there is a lack of competition--in the case of religion, when there is an unmet religious need. Because of the high growth rates of these various churches, it would appear that there is stiff competition and the various churches will check each other's growth.

The second reason why the success of these other churches is relevant is the timing of the growth. During the same years that the growth rate of the Mormons has gone down, the growth rate of these other churches has gone up. This implies that the recent slowdown the Mormons have experienced isn't due to an environmental cause where people are loosing interest in religion. Rather, it implies that the slowdown has to do with something unique to the Mormon faith.

**Membership Model**

**Growth Predictions**

So far I have attempted to demonstrate a few different things. First, that the growth of the church is slowing down and that this slowdown is not due to random fluctuations in the growth rate. Second, that the internal makeup of the church is changing drastically over time and that this change in makeup insinuates that the drivers of church growth are also changing. Third, that there are other vigorous churches in the evolving ecosystem that will make it difficult for the LDS Church to find the ever-growing supply of new recruits that it will need to grow faster and faster as it gets bigger and bigger. Consequently the proposition of exponential growth
over the next several decades seems unlikely. That being the case, what kind of growth patterns can we expect to see?

To test the null-hypothesis that the church was growing exponentially, we used the formula

If we extrapolate the fitted force of growth lines from above and calculate the resulting size of the church, the membership grows approximately linearly for the next 15 or so years and then begins to slow down, eventually reaching a maximum at 18.5 million members in 2031.

Now that we have rejected that hypothesis, we need to consider if this is a functional form that we should extrapolate.

The biggest drawback of this form is that its slope remains constant as \( \alpha \) approaches zero. This seems a bit unlikely whatever force is pushing the growth rate down will probably dissipate as the growth rate gets smaller. Such dissipation would result in a force of growth asymptotically approaching zero rather than linearly crashing into it. Consider the following function form where the rate of growth decays exponentially:

\[
\frac{dM}{dt} = -\alpha M
\]

This meets the criteria of the declining rate of growth gently approaching zero, and is the simplest form with that property to regress.

It turns out that this regression fits the data quite well. The F-statistic has a significance of .001 and the R-squared statistic is .40. It is worth pointing out that over half of the sum of squared errors is associated with the growth single year 1989 when church membership grew by 600,000 despite the fact that the church only reported 400,000 baptisms. If it weren't for this anomalous datum, R-squared would be much higher.

Chart 4 shows the growth of the church according to this model and Table 3 shows the ANOVA (for the regression including the 1989 anomaly). Chart 5 shows a graph of the error terms. From 1983 to 1990 there is some strong autocorrelation. This might be explained by the unexplained growth of 1989 and 1990 being corrections for understated growth in the previous years. From 1991 to 2001 there is no apparent autocorrelation or heteroscedasticity; at least in the later years the model fits the data well and appears to meet the necessary assumptions of constant, uncorrelated errors.
Using membership data from 1844 to the present Duwayne Anderson fit the total membership of the church to a logistics curve. Chart 6 compares my predictions to Anderson’s and Stark’s.

**Conclusion**

For the church to grow exponentially it must do two things: first it must baptize new members that are homogenous with established members in their ability to generate new converts. Second it must be in an environment where it has a competitive advantage. The church is doing a good job of baptizing people who are willing to go on missions, but a poor job of baptizing people who have lots of children that they raise in the church. It probably isn’t doing a very good job of producing new members who are active in the church and thus part of a growing social network. Many other religions are growing faster than Mormonism, and it is unclear how Mormonism would have a competitive advantage over those religions.

Despite increasing the member base and missionary force by 50% over the last decade, the church has been unsuccessful at increasing the number of baptisms by even 1%. When we look at the actual growth rate of the church from 1983 to 2000 there is strong statistical evidence that the slowing growth is due to an underlying trend rather than random fluctuations.

Looking forward the question is will the growth rate continue to go down, bottom out, or rebound? The above factors lead me to believe that it will continue to go down, but at slower rates, reaching about 30 million members by the year 2080.

**Footnotes**

1. See Appendix A of this document for an explanation of the Mathematics of Exponential Growth

2. The regression was run using data from 1860 to 1999. The simple regression gave a Durbin Watson statistic of 1.36 indicating a high amount of serial correlation in the errors. To adjust for the serial correlation, the model was transformed to an AR(1) model. The Hildreth-Lu Procedure indicated that the value of . The ANOVA statistics discussed in this paper are on the transformed model.
 References


