

## **ABSTRACT**

### **EXPLAINING BOX OFFICE PERFORMANCE FROM THE BOTTOM UP: DATA, THEORIES AND MODELS**

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Every week, there are more than 50 movies playing in theaters from which movie-goers can choose. Analyses of the relative box office success of these films shows that it is Pareto-distributed, with roughly 20% of them earning 80% of the overall revenue. Arthur De Vany studied the potential causes of this ‘winner-take-all’ distribution through equation-based analyses, and theorized that the Pareto-distributed box office revenues we observe emerge from the micro-level complex adaptive behavior of movie-goers with imperfect information.

The literature is replete with attempts to explain how blockbuster movies occur, yet clearly none have found the secret formula. Several concluded a relationship between attributes and box office success through the information signaled or generated by the attribute, but all have suffered from an inability to separate the effect of movie attributes from the effect of word of mouth.

In this dissertation I created an agent-based model of movie attendance called ChatterMod, where movie-goers with heterogeneous and incomplete information choose from a supply of homogenous films devoid of 'preference' attributes (e.g. rating, genre, existence of stars) and then exchange information about the film with their neighbors. ChatterMod explains how the skewed macro-level distribution of box office revenues arises from a) a scale-free network of movie-goers with heterogeneous levels of movie awareness, b) each movie's revenue relative to existing films, c) the competition for movie-goer attention posed by information on new films, and d) the percolation of movie information throughout the network via word of mouth. In ChatterMod, there is no question as to whether or not a direct relationship between information and box office revenue exists, because there are no other attributes in the model that can affect that relationship. The model produced similar statistical behavior to prior empirical research and intuitive behavior when word of mouth and advertising were adjusted.

With this model, I provide a controlled laboratory for future research in movie information dynamics including the degree to which an initial movie-goer node's connectedness or each node's trust in its neighbors affect the success of a film, the identification of information tipping points or real world proxies for word of mouth, and the effect of the network structure on the overall distribution of revenue. This model can also be applied outside the film industry to study information dynamics in other areas such as music and book sales, website popularity, and voting. Finally, this dissertation provides further evidence that box office revenues cannot be predicted, and in the words of Goldman (1983) echoed by De Vany (2004), "nobody knows anything."