Investing in Reputation:
Strategic Choices in Career-Building

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Abstract

In many occupations, reputation or past performance affects the demand for a worker's output, creating an incentive to invest in reputation early in a career. This results in a tendency for superior workers to start their career in the mainstream market. The intuition is that, for high ability workers, the returns to investing in reputation is larger in the mass market, while less able ones would avoid the more competitive mainstream by developing their specializations in the fringe market. Some mainstream workers may enter the fringe market once the motive to invest in reputation diminishes later in their careers, but less able workers who start in the fringe are seldom able to return to the mainstream. These results are empirically testable and have potential implications for product markets as well.

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I. Introduction

One complaint about the classical music catalog is that there are too many duplications of the central repertoire.[1] Music critics often question whether we need yet another rendition of the popular pieces. Yet, these are also works on which most of the brightest stars cut their teeth. With few exceptions, the most promising talents and prodigies signed by the major record companies usually launch their recording careers with recordings of the standard warhorses. The Evgeny Kissins among the pianists have their Chopin, and the Anne Sophie Mutters among the violinists have their handful of Romantic violin concertos. By comparison, young exponents of fringe and special-interest repertoires are generally rather less stellar. While the popularity of the music the stars play might have contributed to their fame, this observation does suggest a possible match between talent and repertoire at the beginning of careers of recording artists. However, if such a match exists, it is certainly less obvious as careers unfold. Some established stars, having achieved fame in mainstream music, sometimes become more adventurous in their choice of music later in their careers, diversifying into less familiar repertoires. On the other hand, it is rather less often that musicians who have specialized in the fringe market could successfully re-establish themselves in the mainstream market.

This phenomenon is not restricted to classical music recording artists. In fact, in many markets for professionals, we can observe similar patterns of sorting and asymmetric mobility.

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[1]In the British catalog of Classical recordings in circulation, works of 2,772 composers are represented. Among them, the ten most popular composers account for 21% of all recorded works, while around 40% are by the thirty most popular composers.

Another familiar example is our very own profession. Few will dispute that there is a higher concentration of talents in the mainstream fields and theories of general interests (even if there may be some disagreement on what these fields are) where contributions to the discipline are potentially greatest. Areas of relatively narrow interests, such as regional studies or policy analysis of more restrictive applications, will attract mainly those who are strongly interested, or those who are less competitive. And while Nobel laureates will be asked, and often will offer insights on topics which are outside their earlier areas of expertise, established authorities in very specialized fields are usually recognized only as such and seldom switch back to mainstream research later in their careers, unless they are among the few who are able to redefine the discipline. Such sorting may also be observed in the legal professions. Why, then, do we have this kind of sorting and asymmetry of mobility between the mainstream and the fringe markets?

The sorting of workers into different careers and the resulting dispersion in earnings are important topics that have received much attention in the economics literature. It is well known that, when workers and jobs are heterogeneous, the match between them is not random, but involves self-selection. Among early works, Roy's (1953) fable of "hunters" and "fishermen" in a "primitive community" is perhaps the most significant. Sorting in this two-sector model is driven by a difference in output variance in the two sectors, with the correlation between skills in the two activities also playing an important role in the outcome. Other alternative approaches to this assignment problem are surveyed in Sattinger (1993). One particular line of research seeks to explain the observed skewness in the distribution of earnings by mechanisms that tend to exacerbate the underlying inequality in workers' abilities. Becker (1981) postulates a positive assortative mating in marriages when there is productive complementarity between partners, in which superior males are mated with superior females, an insight as applicable to the labor market as it is to the marriage market. Rosen (1981) suggests a convexity in returns to ability that can be traced to both external scale economies (when the output exhibits certain public good characteristics) and internal scale diseconomies (when superior talents are better able to overcome congestion in production). The result is a disproportionate concentration of market and earnings among the most talented. In a related work, Rosen (1983) shows that when the productivity of a manager filters down a firm's hierarchy through a "recursive chain of command technology," efficiency dictates the assignment of superior talents to top positions within a hierarchy, and to larger firms with wider spans of control. Similar results obtain in Kremer (1993), even though a different technology is assumed. In his "O-Ring production function," the weakest link among the workers has a multiplicative effect on output of the firm, so that workers are matched by ability in equilibrium. As a result, superior workers benefit from working with both better co-workers and more capital. Common to all of these models is the existence of increasing returns to ability in equilibrium which further boosts the fortune of the talented at the expense of the mediocre. Adler (1985), however, shows that stardom can arise when there is consumption spillover, even when all workers are equally talented.

All of the above models discuss sorting as a static process. What is apparently ignored is the fact that the pursuit of a career involves strategic decisions at different stages, as the worker maps out an optimum career path. Becker's (1981) marriage model allows for divorce, but that only arises from ex post mismatches: moving up the social ladder by a deliberate plan of sequential marriages is not an option. In this paper, we shall try to analyze these decisions in a dynamic context in order to explore the equilibrium that arises from the assignment process. This will not only allow for greater realism in the modeling of career decisions, but will also uncover insights that are otherwise lost in a static analysis.

There are many considerations that affect a worker's career moves. In certain occupations, reputation or past performance affects the demand for a worker's output. This creates an incentive for workers to invest in reputation when they are young so as to reap "reputation premium" later in their careers. When markets are segmented and information is not perfectly transmitted across generations, there is a tendency for superior workers to start their careers in the mainstream market because of higher returns from gaining exposure in a larger market. On the other hand, lower ability workers could do better by avoiding the competitive field in the mainstream and develop their specializations in niche markets. This results in a positive match in market size and workers' abilities. However, as the investment incentive diminishes over the lifecycle, some mainstream workers, particularly those with superior abilities, may actually enter the niche markets later in their careers. Reverse mobility, by contrast, is limited, as, not having established reputation in the mainstream market, niche market workers will find it difficult to switch.

Although we focus on career decisions of professionals (and of classical music recording artists in particular), the implications of this analysis have broad relevance and can be applied to many issues. Indeed, there is much in common between building a career and building a brand name, a business, or an institution. How a product should be positioned in the market and promoted over time is an intriguing problem that is conceptually similar to a worker's career strategy, and one which we hope can be informed by our research.

II. The Model

Consider an overlapping generation model in which all agents live two periods. There are two types of agents, consumers and producers, in a market. If we use the market for classical music recordings as our example, the consumers are record or compact disc buyers, and the producers, recording artists. In the real world, there are other factors of production, such as capital supplied by record companies and sales services provided by wholesalers and retailers, but for simplicity, we shall abstract from such complications by assuming that record buyers transact directly with artists.

In each period, there is an equal number (*N*) of young and old consumers, each of whom purchases one and only one compact disc from a musician at a fixed price, normalized to 1. Being novices, young consumers do not have any information on recording artists, and they limit their choices to the "mainstream" or standard repertoire (*M*). Given that most classical music listeners start their collection with the Beethoven symphonies, the Mozart concertos or the Vivaldi Four Seasons, this assumption is not a serious violation of reality. When consumers grow older (i.e. enter the second period of their life) and wiser, they acquire information about the artists. An exogenously determined percentage (γ) of them continue to listen only to the popular works, while the remaining ones ($1 - \gamma$) move on to more specialized or "fringe" music (*F*).[2] This is certainly consistent with the generally observed pattern of development of taste for music or

[2] We also try the assumption that, among old consumers who continue to demand mainstream music, γ_1 percent learn only about the reputation of old artists who have been producing mainstream music in the previous period, while a more informed γ_2 percent of them know the reputation of all artists, where $\gamma = \gamma_1 + \gamma_2$. The results (except for Proposition 2) are basically the same. Therefore, in order to simplify the presentation, we assume $\gamma_1 = 0$, so that all old consumers have the same information set.

any form of art, where the avant garde and highly specialized repertoires enjoy a following only among smaller circles of seasoned connoisseurs. Appreciation for less immediately accessible works is an acquired taste that requires the accumulation of specific "consumption capital" (Becker 1996), and not everyone will make such an investment. With both young and old consumers in the market, there will always be greater demand for the music of Bach and Beethoven than for the music of Zelenka and Zemlinsky.

Music recordings, whether of the mainstream or the fringe repertoires, are heterogeneous. Their quality depends on the talent of the recording artists. A talented artist delivers more captivating performances that, ceteris paribus, bring higher utility to the consumer. Importantly, we assume that utility derived by a consumer from a recording depends also on the reputation of the artist. This assumption can be justified by the consumption spillover interpretation by Adler (1985) or a similar social interaction effect in Brock and Durlauf (2001): a music lover's enjoyment of a performance or recording is enhanced by information about the artist and by the sharing of the information with other fans of the artist, a phenomenon which is particularly visible in popular music but exists even in classical music. Alternatively, the assumption can also be explained by a general "validation" effect, in which a consumer derives confidence in his own purchase from similar choices of others. In any case, such reputation depends on previous demand but not on current production decision, which means that reputation can be transferred across markets.[3] The greater the demand for the music of an artist in the previous period, the higher his reputation, the greater the consumption externality, and the higher will be the utility

[3] Consumers who buy "cross-over" albums of Luciano Pavorotti and Yo Yo Ma are surely aware of these artists' reputation in classical music.

that a consumer derives from the artist's music. Only old artists have reputations: young musicians do not have any track record until they establish themselves in the second period of their life. Unobserved heterogeneity in preference among the consumers is captured by a continuous random variable, ε, while the artists' skills (q) can take on two values: $q \in \{q^H, q^L\}$, where $q^H > q^L$. The number of high-skilled and low-skilled artists are n^H and n^L, respectively.

Given these assumptions, the analysis of the consumers' choices can be further simplified if a consumer's utility from a music recording purchase is assumed to be additive in q, ε, and the reputation of the artist who recorded the music. As noted above, reputation depends on previous demand for the artist's recording, but since we shall be focusing on steady state equilibrium, the previous demand for a given kind of music (M or F) recorded by an old artist of a given type (H or L) will be the same as the current demand for the same type of music performed by a young artist of the same type. Accordingly, we can suppress all time subscripts and let the utility that a young consumer j derived from a recording of a performance of a type i artist be represented by

$$U_{ij} = q^i + \varepsilon_{ij} \ , \tag{1a}$$

while that derived by an old consumer is

$$U_{ij} = q^i + R^i(m) + \varepsilon_{ij} \ , \tag{1b}$$

where $i = H,L$, $m = M,F$, and $R^i(m)$ represents the previous demand for type m music recorded by a type i artist. In accordance with our assumptions, $R^i(m) = 0$ if the old consumer buys a recording of a young artist with no reputation.

Each artist, whether high-skilled or low-skilled, has the choice of recording either mainstream music (M) or fringe music (F) in each of the two periods of his life. Therefore, in each cross section, depending on their past and current production decisions, there are conceptually six different groups of artists competing in the market: (1) young artists who plays the mainstream repertoire (S_M); (2) young artists who plays the fringe repertoire (S_F); (3) old artists who play mainstream music throughout their careers (S_{MM}); (4) old artists who play fringe music throughout their careers (S_{FF}); (5) old artists who had played mainstream music when they were young but now plays fringe music (S_{MF}); and (6) old artists who had played fringe music when young but is now playing mainstream music (S_{FM}). Thus, in any period, the artists comprising S_M, S_{MM}, and S_{FM} produce mainstream music, while those comprising S_F, S_{MF}, and S_{FF} produce fringe music.

The choice among different careers depends on the lifetime utility that each artist derives from the alternatives, which, assuming no discounting, is simply the sum of utilities in each period. Utility in each period in turn depends on revenue from the sale of music recordings (which is equal to demand, since price is normalized to one) , as well as on the satisfaction (or cost) that the artist derives from the playing the music. Some classical musicians have a natural inclination to explore the fringe or the avant garde with little market appeal, while others like to interpret and reinterpret the Classical-Romantic masterpieces. Such variation is prevalent not only in "creative" industries involving artistic pursuits, but also in other professions, including academic research. We represent an artist's preference for playing *F* rather than *M* by a random variable, s. Without much loss of generality, it is assumed that the distribution of s, g(s), is symmetrical around zero between -$\bar{s}$ and +$\bar{s}$, and that an artist's utility is additive. For a young artist k of type i, utility (net of a fixed cost of effort and assuming zero marginal cost of production) for the period is given by

$$R^i(M) \qquad \text{if he plays } M, \qquad (2a)$$

and

$$R^i(F) + s_k \qquad \text{if he plays } F, \qquad (2b)$$

where $i = H,L$.

Compared to young artists, old artists have the advantage that they have track records on which they can build their professional reputation and secure a following among fans. The returns to reputation depend on the exposure that the artists gained and therefore on the music they played when they were young. For an old artist k of type i who played M when young, his utility in the second period is:

$$R^i(MM) \qquad \text{if he plays } M, \qquad (3a)$$

and

$$R^i(MF) + s_k \qquad \text{if he plays } F. \qquad (3b)$$

Similarly, for an old artist of type i who played F when young, his second period utility is $R^i(FM)$ if he switches to playing M, and $R^i(FF) + s_k$ if he continues to play F. The notation $R^i(mn)$ represents market demand for type n music ($n = M,F$) recorded by a type i artist who has played m in the previous period ($m = M,F$).

$R^i(m)$ and $R^i(mn)$ for the different i, m and n are endogenous demands to be derived. If ε, the consumers' preference random variable in equations (1a) and (1b), follows the extreme value distribution, then, in steady state, the market share of each type of artist can be represented as logits (Anderson, de Palma and Thisse, 1992). Since young and old consumers have different information, they must be treated as different markets in the calculation of these market shares. For example, a young type i artist who plays M would have to compete against other artists in S_M,

S_{MM}, and S_{FM} in selling his music to young consumers as well as to old consumers. Since young consumers do not have information on artists and therefore do not distinguish between young and old artists, their demand for the young artist's music is

$$T_1^i = e^{q^i} \Big/ \left\{ \sum_{j=H,L} \sum_{k \in S_M} e^{q_k^j} + \sum_{j=H,L} \sum_{k \in S_{MM}} e^{q_k^j} + \sum_{j=H,L} \sum_{k \in S_{FM}} e^{q_k^j} \right\}.$$

His market share is, however, lower among old consumers who know the reputation of old artists in S_{MM} and S_{FM}. Furthermore, market size is smaller among these consumers because only a fraction (γ) of them continues to demand mainstream music. Old consumers demand for the young type *i* artist's recording of mainstream music is

$$T_2^i = \gamma N e^{q^i} \Big/ \left\{ \sum_{j=H,L} \sum_{k \in S_M} e^{q_k^j} + \sum_{j=H,L} \sum_{k \in S_{MM}} e^{q_k^j + R_k^j(M)} + \sum_{j=H,L} \sum_{k \in S_{FM}} e^{q_k^j + R_k^j(F)} \right\}.$$

The total demand for a young type *i* artist's recording of mainstream music is, therefore,

$$R^i(M) = T_1^i + T_2^i \cdot \qquad (4)$$

Compared to the young artists, old artists benefit from their reputation which, however, is recognized only by old consumers. Thus, a type *i* artist who records mainstream music in both the previous and the current period will face a current demand of

$$\begin{aligned} R^i(MM) &= N e^{q^i} \Big/ \left\{ \sum_{j=H,L} \sum_{k \in S_M} e^{q_k^j} + \sum_{j=H,L} \sum_{k \in S_{MM}} e^{q_k^j} + \sum_{j=H,L} \sum_{k \in S_{FM}} e^{q_k^j} \right\} \\ &\quad + \gamma N e^{q^i + R^i(A)} \Big/ \left\{ \sum_{j=H,L} \sum_{k \in S_M} e^{q_k^j} + \sum_{j=H,L} \sum_{k \in S_{MM}} e^{q_k^j + R_k^j(M)} + \sum_{j=H,L} \sum_{k \in S_{FM}} e^{q_k^j + R_k^j(F)} \right\} \qquad (5) \\ &= T_1^i + e^{R^i(M)} T_2^i \;. \end{aligned}$$

Similarly, a type *i* artist who played fringe music in the previous period but has switched to the mainstream will face a current demand of

$$R^i(FM) = T_1^i + e^{R^i(F)} T_2^i \ . \qquad (6)$$

A comparison of equations (4), (5) and (6) shows the advantage of veteran artists lies entirely in their deeper penetration into the market of old consumers. Market penetration is captured by the "impact factor" $e^{R(k)}$, $k = M,F$. If T_2^i represents the demand by old consumers for the music of a type *i* (young) artist without reputation, then $(e^{R^i(k)} - 1)T_2^i$ represents a "reputation premium" enjoyed by artists with track records. If $R^i(M) > R^i(F)$, then returns to investing in reputation in the mainstream market earlier in a career is higher than investing in the fringe market. The resulting effects on career choices will be analyzed in greater detail in the following section.

Demand for fringe music is more simply characterized since, by assumption, this type of music has no market among young consumers. There are again three types of artists in this market: young upstarts who play the fringe repertoire (S_F); old artists who have played mainstream music previously but now switch to fringe music (S_{MF}); and old artists who started their career with and continue to play fringe music (S_{FF}). The demand for fringe music recorded by a type *i* artist in S_F can be represented as:

$$R^i(F) = (1-g)Ne^{q^i} \Big/ \left\{ \sum_{j=H,L} \sum_{k \in S_F} e^{q_k^j} + \sum_{j=H,L} \sum_{k \in S_{MF}} e^{q_k^j + R_k^j(M)} + \sum_{j=H,L} \sum_{k \in S_{FF}} e^{q_k^j + R_k^j(F)} \right\} . \ (7)$$

The demand for recordings of old artists can then be shown to be:

$$R^i(MF) = e^{R^i(M)} R_F^i , \qquad (8)$$

or $$R^i(FF) = e^{R^i(F)} R^i_F \; . \qquad (9)$$

Equations (7), (8) and (9) again show the "reputation effect" in action, with established artists earning a premium by virtue of previous demands for their recordings of either *M* or *F*.

III. Skills, Market Size, and Equilibrium Career Paths

With two types of repertoires and two periods in an artist's life, there are conceptually four possible types of careers (*M-M*, *M-F*, *F-M*, or *F-F*). However, in the following, we rule out careers in which an artist starts a career recording fringe music before switching back to the mainstream (i.e. an *F-M* career):

Proposition 1. If an artist chooses to produce fringe music in the first period, then he will not produce mainstream music in the second period.

Proof: See the appendix.

The intuition behind this result is basically that a career that starts in the fringe market and later switches back to the mainstream is time-inconsistent and therefore will not be chosen by a rational agent. Consider an artist who follows such a career. His choice implies that starting in the fringe dominates any other alternative career that starts in the mainstream. Suppose the best alternative for him that starts in the mainstream is an *M-M* career (i.e. $R^i(MM) > R^i(MF) + s$). This implies that if the artist starts in the mainstream, it does not pay for him to switch to the fringe, indicating a relatively large mainstream demand that more than compensate for the preference for fringe music. But if this is the case, an *F-M* career cannot be optimum, as the artist will always be better off with an *M-F* career. Both careers (*M-F* and *F-M*) would offer *s* over the lifecycle, but starting in the mainstream allows the artist to achieve higher income and greater reputation in the first period. This has an exponential effect on market penetration in the second period that more than offset the smaller size of the fringe market. Therefore, if the artist must make a mid-career switch, it would be better for him to start in the mainstream and switch to the fringe than the other way around. But an *M-F* career itself is dominated by an *M-M* career by assumption. Therefore, one would not observe any career move from the fringe to the mainstream, because the returns that could have motivated such a move would have made it even more worthwhile for the artist to pursue his entire career in the mainstream.

Consider the other possibility that the best alternative career that starts in the mainstream is an *M-F* career, involving a switch to the fringe in the second period (i.e. $R^i(MF) + s > R^i(MM)$). The fact that, by assumption, an *F-M* career is optimum and therefore chosen over an *M-F* career indicates that it is more efficient to invest in reputation in the *F* market in this case. This suggests that even though the fringe market is smaller, the demand for the artist's recording of fringe music is actually larger than the demand for his recording of mainstream music. The fact that an *M-F* career dominates an *M-M* career also indicates that, given his preference, reputation achieved in the mainstream market in the first period can bring higher returns in the fringe market. But if this is the case, the higher "reputation" from investing in the fringe market in the first period would only further magnify the advantage of recording fringe music in the second period, so that if the artist starts in the fringe market, he would have even stronger incentive to continue his career in that market rather than switching back to the mainstream. Thus, if an *M-M* career is dominated by an *M-F* career, an *F-M* career will also be dominated by an *F-F* career.

By Proposition 1, artists who start their careers in the fringe will never switch back to the mainstream. Can we also draw the same conclusion about artists who start in the mainstream?

The following proposition establishes the condition under which career switches from the mainstream to the fringe will be observed.

Proposition 2. As long as the fringe market is not too small ($\gamma < 0.5$), there will be some artists who will start their careers in the mainstream but switch to the fringe in the second period.

Proof: See the appendix.

Proposition 2 shows that the viability of an *M-F* career depends on the relative sizes of the markets. By assumption, there are more consumers in the mainstream market, so there must be more mainstream artists in equilibrium, and only those with a relatively strong preference for fringe music will enter the fringe market. Since an *F-M* career is ruled out by Proposition 1, artists who perform fringe music will follow either an *F-F* career or an *M-F* career. In terms of sales, the mainstream market is still more lucrative, but if the demand for fringe music among old consumers is large ($\gamma < 1- \gamma$), then the penalty for switching from a large market to a small market in the second period is not so large, particularly since mainstream artists enjoy a higher reputation premium than artists who start in the fringe market. As a result, once the incentive to invest in reputation dissipates in the second period, some mainstream artists would actually enter the fringe market in order to satisfy their preference for playing fringe music. In fact, if the fringe market is large enough, even some artists with a distaste for fringe music ($s < 0$) would switch to the fringe market if the higher returns to their established reputation more in that market than offset the loss of demand among young consumers. On the other hand, if the fringe market is small ($\gamma > 1- \gamma$), the loss in revenue may discourage any mainstream artist from entering the fringe market, and there may be complete specialization in careers. Both cases are possible, depending on the value of γ, but in the following, we shall maintain the assumption that $\gamma < 0.5$, so that our model can be used to analyze strategic switches in careers.

There are, therefore, three observed types of careers among artists: *M-M*, *M-F,* and *F-F*. Given the ability (i) of the artists, the sorting of artists with different s into the different careers can be represented by figure 1, which shows an artist's lifetime utilities from different careers as functions of s, given the decisions of other artists. Thus, for an artist k of type i,

$$k \in S_{MM} \quad \text{if} \quad -\bar{s} < s_k < \tilde{s}_2^i;$$

$$k \in S_{MF} \quad \text{if} \quad \tilde{s}_2^i < s_k < \tilde{s}_1^i;$$

$$k \in S_{FF} \quad \text{if} \quad \tilde{s}_1^i < s_k < \bar{s}\ .$$

Equations for T_1^i, T_2^i, and $R^i(F)$ can then be rewritten as:

$$T_1^i = Ne^{q^i} \Big/ \left\{ \left(G(\tilde{s}_1^{\,L}) + G(\tilde{s}_2^{\,L}) \right) n^L e^{q^L} + \left(G(\tilde{s}_1^{\,H}) + G(\tilde{s}_2^{\,H}) \right) n^H e^{q^H} \right\}, \qquad (10)$$

$$T_2^i = g\, Ne^{q^i} \Big/ \left\{ \left(G(\tilde{s}_1^{\,L}) + G(\tilde{s}_2^{\,L}) e^{R^L(M)} \right) n^L e^{q^L} + \left(G(\tilde{s}_1^{\,H}) + G(\tilde{s}_2^{\,H}) e^{R^H(M)} \right) n^H e^{q^H} \right\}, \ (11)$$

$$R^i(F) = (1-g) Ne^{q^i} \Bigg/ \left\{ \begin{aligned} &\left[\left((1+e^{R^L(F)})(1-G(\tilde{s}_1^{\,L})\right) + \left(G(\tilde{s}_1^{\,L}) - G(\tilde{s}_2^{\,L}) e^{R^L(M)} \right) \right] n^L e^{q^L} \\ &+ \left[\left((1+e^{R^H(F)})(1-G(\tilde{s}_1^{\,H})\right) + \left(G(\tilde{s}_1^{\,H}) - G(\tilde{s}_2^{\,H}) e^{R^H(M)} \right) \right] n^H e^{q^H} \end{aligned} \right\}, \ (12)$$

where $G(\cdot)$ is the distribution function of s.

The equilibrium values of $\tilde{s}_t^i$, $t = 1,2$, differ across types of artists (i). This implies that artists of different talents may have different career decisions. The following proposition states the relation between artists' talents and the choice of market in the first period of their careers.

Proposition 3. More talented artists have a higher propensity to start their career in the mainstream market (i.e. $\tilde{s}_1^H > \tilde{s}_1^L$).

Proof: See the appendix.

The intuition for this result should be obvious. Holding constant their preferences in performing different types of music, artists of different abilities have the same objective at the beginning of their career: to maximize revenue from current sales, which would also bring higher reputation premium later in the career regardless of which market they cater for at that stage. To achieve this objective, starting in the mainstream has an obvious advantage in that total demand is higher. Therefore, other things being the same, artists of either type would tend to gravitate towards the more lucrative mainstream market. Talented artists have absolute advantages in both the mainstream and the fringe markets, but because market share and returns to reputation is convex in ability, they have a comparative advantage in the mainstream, while the less talented have a comparative advantage in the fringe market where the smaller market size is compensated by a less competitive field. Therefore, only those talented artists with a relatively strong preference for fringe music would be willing to forgo the higher revenue in the mainstream market, while among the less talented, only those with a relatively strong distaste for fringe music would enter the mainstream market even though they are less competitive in the that market. This results in a positive assortative matching between talent and market size at the beginning of artists' careers. That is why we observe that the most promising and heavily promoted prodigies almost always launch their careers with popular works that are squarely in the standard repertoire.

Not only do artists of different talents have different propensities on the choice of music at the beginning of their careers; they also differ in their subsequent decisions on mid-career moves. Since a switch from the fringe market to the mainstream market is precluded by Proposition 1, we analyze the relationship between talent and mobility from the mainstream to the fringe market.

Proposition 4. If s is uniformly distributed, then talented artists would have a higher tendency to switch from the mainstream market to the fringe market in the second period of their careers.

Proof: See the appendix.

There are two reasons for mid-career switches in markets. Firstly, for artists who start in the mainstream market, when there are more old consumers demanding the fringe product than the mainstream product ($\gamma < 0.5$), the reputation established from previous sales ($e^{R(M)}$) commands higher returns in the fringe market (because $R^i(F) > T_2^i$ in equilibrium), even though demand in the mainstream market, inclusive of novice consumers, remains larger in gross terms. This increase the relative attractiveness of the fringe market to the artist compared to when he first started his career. We can call this the "effective market size" effect. Secondly, for artists of the same ability, those who launched their careers in the mainstream would have secured greater reputation than those who started off in the fringe ($e^{R(M)} > e^{R(F)}$). They are therefore in a position to grab a larger share of the fringe market than the latter, should they decide to switch. We can call this the "market penetration" effect. These two effects change the cost and benefit of recording fringe music, and marginal artists who have not found it worthwhile to perform fringe music in the first period given their preference (s) will now have the financial incentive to switch from the mainstream to the fringe once they have established their reputation, and will make the move accordingly.

The magnitude of the "effective market size" effect depends on the artist's reputation premium, and therefore on the market demand for his music in the first period ($R^i(M)$). It also depends on the difference between demands for the different types of music by old consumers ($R^i(F) - T_2^i$). The magnitude of the "market penetration" effect depends on the difference between "impact factors" achieved by artists of a given type (*H* or *L*) who made different production decisions in the first period ($e^{R^i(M)} - e^{R^i(F)}$), as well as on the demand for fringe music ($R^i(F)$). All are increasing and convex in artists' talents. Therefore, we would expect greater incentive to move and proportionately more career switches among talented artists.

Again, such a phenomenon is not limited to recording artists. Other performing artists, including movie stars and directors, often find that early commercial success can bring greater flexibility in their subsequent artistic pursuits, allowing them to indulge in pet projects that would not have been viable but for their established fame. Of course, not all stars will switch: it depends on their preferences for the different types of performance. For every Ann Sophie Mutter who ventures into more contemporary music once she has achieved superstardom, there are probably more than one Artur Rubinstein who remain committed to the mainstream repertoire throughout their careers. But it remains true that it is far easier for mainstream stars to enter the fringe market than a mid-career move in the opposite direction, as many stage actors and actresses with Hollywood aspirations can attest.

To recapitulate, in our model of dynamic career choices, with two types of artists of different talents, two different products or types of music, and two-period careers, there will be proportionately more talented artists who will start their careers in the mainstream or larger market, but there may also be proportionately more of these artists who will make mid-career moves to the fringe market. Whether we will observe career switches, however, depends on the size of the fringe market. If demand for the fringe product is too small, we would expect complete specialization in the artists' careers. These predictions are empirically testable and appear to be consistent with observations in many professions.

IV. Conclusion and Discussion

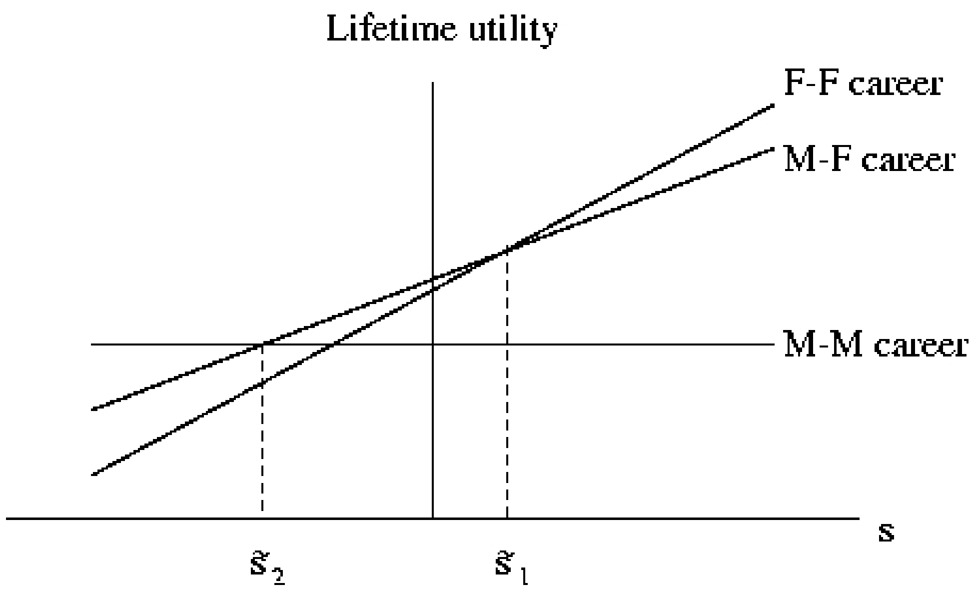
In this paper, we offer a simple overlapping-generation model in which workers or artists have to decide between a mainstream and a fringe market in each period of their two-period careers. Because the demand for an artist's output depends on his reputation, the artist has the incentive to invest in reputation early in his career. This results in strategic decisions as the artist maps out an optimum career path that maximizes his lifetime utility. Because the reputation premium is assumed to be convex in talent, more talented artists would tend to start their careers in the larger mainstream market where they can achieve higher reputation through higher sales volume, while the less talented would tend to specialize in the fringe market where the field is less crowded, and the competitors less productive. As the investment incentive diminishes over the lifecycle, some artists who start in the mainstream market may find it worthwhile to switch to the fringe market later in their careers as long as demand for the fringe product is not too small. The financial incentive for switching is particularly high among talented artists because their higher reputations enable them to secure deeper penetration in the fringe market. However, artists who start in the fringe market tend to stay, because those who find it worthwhile to switch will not have started in the less lucrative fringe market in the first place. There is therefore both an asymmetry in career mobility between the markets, as well as differences in career choices between artists of different abilities. These results are generalizable to many professions where past reputation affects current demand.

The simple setup of the model offers unambiguous predictions, but the simplifying assumptions may constrain the generalizability of some of the results. One possible way of extending our results involves introducing uncertainty into the model. In our analysis, artists know their ability and plan their careers accordingly. There are neither ex ante uncertainties, nor ex post surprises that warrant changes in career plans. In reality, uncertainty about their own abilities may prompt some artists to try their luck in the larger market early in their careers, but retreat to the fringe market if things do not work out. Incorporating imperfect information may allow us to explore such learning behavior. It will likely weaken sorting at the beginning of careers but strengthen our conclusions on career moves.

In our model, we have ruled out price competition. In the classical music market, if we restrict our attention to premium-priced software, the sorting of talents across repertoires postulated in our analysis is indeed quite apparent. However, there is considerable price variation in the market, and the picture becomes more clouded once low-priced issues are taken into account. Many record companies offer the standard repertoires performed by no-name artists at substantial discounts, catering for a budget-conscious or less discerning clientele which do not care so much about the quality of the performance or the reputation of the artists, but are satisfied with any rendition of the music that interests them. We would then observe artists of both high and low caliber compete in the mainstream market while the mediocre specialize in the fringe market. It adds a further twist to our story which can be explored by endogenizing prices in our model.

Another potential extension is the endogenization of the market sizes. So far, we have assumed market demands to be exogenously determined. In particular, the size of the fringe market is fixed at $(1-\gamma)N$, the number of old consumers who have developed the taste for fringe music. The problem is then reduced to splitting the fixed amount of rent in the two markets among a fixed number of artists with well-defined distributions of talent and preferences. If the demand for fringe music depends endogenously on the talent of artists entering that market, the sorting of artists may become more complicated, as the fringe market may attract some superior talents who believe they can expand the size of the market. In the extreme case, what starts off as a niche product may become part of the mainstream. This is a fascinating problem that we hope to work on in the future.

Figure 1


Lifetime utility
F-F career
M-F career
M-M career
s
$\tilde{s}_2$
$\tilde{s}_1$

Appendix

A. Proof of Proposition 1

The proposition will be proved by contradiction. Suppose a type *i* artist with $s = s_k$ chooses to record fringe music in the first period of his career, and mainstream music in the second period. Then it must be the case that starting the career in the fringe market brings higher utility than starting in the mainstream, but switching to the mainstream in the second period brings higher utility than continuing in the fringe market. In other words, the following must be true:

$$\begin{aligned} &R^i(F) + s_k + \max\left\{R^i(FF) + s_k,\ R^i(FM)\right\} \\ &\quad > R^i(M) + \max\left\{R^i(MM), R^i(MF) + s_k\right\} \end{aligned} \tag{A1}$$

and

$$R^i(FM) > R^i(FF) + s_k . \tag{A2}$$

Using (A2), (A1) can be rewritten as

$$R^i(F) + s_k + R^i(FM) > R^i(M) + \max\left\{R^i(MM), R^i(MF) + s_k\right\}. \tag{A3}$$

There are two possible cases under which condition (A3) can hold:

(i) $R^i(MM) < R^i(MF) + s_k$

In this case, condition (A3) can be simplified to

$$R^i(F) + R^i(FM) > R^i(M) + R^i(MF) ,$$

or

$$R^i(F) - R^i(MF) > R^i(M) - R^i(FM) .$$

Using equations (4), (6), (7) and (8), this implies

$$R^i(F)\left(e^{R^i(M)} - 1\right) < T_2^i\left(e^{R^i(F)} - 1\right). \tag{A4}$$

Recall equation (A2) and the condition that $R^i(MM) < R^i(MF) + s_k$. These imply

$$R^i(FM) - R^i(MM) > R^i(FF) - R^i(MF),$$

which, using equations (5), (6), (8) and (9), simplifies to

$$\left(e^{R^i(F)} - e^{R^i(M)}\right)\left(T_2^i - R^i(F)\right) > 0.$$

This condition holds if either (a) $T_2^i > R^i(F) > R^i(M) > 0$; or (b) $0 < T_2^i < R^i(F) < R^i(M)$. The former is impossible because $R^i(M) = T_1^i + T_2^i > T_2^i$, so the latter is the only possibility. But (b) also contradicts (A4). Therefore, if $R^i(MM) < R^i(MF) + s_k$, (A3) cannot hold and a artist will not switch to *M* if he starts with *F*.

(ii) $R^i(MM) \geq R^i(MF) + s_k$

Under this condition, (A3) can be rewritten as

$$R^i(F) + s_k + R^i(FM) > R^i(M) + R^i(MM)$$

which, together with (A2), implies

$$R^i(F) + 2\,R^i(FM) > R^i(M) + R^i(MM) + R^i(FF).$$

Using equations (4) - (9), this simplifies to

$$\left(2e^{R^i(F)} - e^{R^i(M)} - 1\right)T_2^i > \left(e^{R^i(F)} - 1\right)R^i(F), \qquad \text{(A5)}$$

which implies $2T_2^i > R^i(F)$. Since $R^i(M) = T_1^i + T_2^i$ and $T_1^i > T_2^i$, it must follow that

$$R^i(M) > 2T_2^i > R^i(F). \qquad \text{(A6)}$$

Equations (A5) and (A6) further imply

$$\left(e^{R^i(M)} - e^{R^i(F)}\right)T_2^i < \left(e^{R^i(F)} - 1\right)\left(T_2^i - R^i(F)\right),$$

which, since $R^i(M) > R^i(F)$ from (A6), would mean that $T_2^i > R^i(F)$. Thus, (A6) can be modified to

$$R^i(M) \;>\; 2T_2^i \;>\; T_2^i \;>\; R^i(F)\,. \qquad \text{(A6')}$$

(A5) and (A6') would then imply

$$\left(e^{2T_2^i} - e^{T_2^i}\right)T_2^i \;<\; \left(e^{R^i(M)} - e^{T_2^i}\right)T_2^i \;<\; \left(e^{T_2^i} - 1\right)\left(T_2^i - R^i(F)\right).$$

Since $T_2^i > T_2^i - R^i(F)$, it must mean

$$\left(e^{2T_2^i} - e^{T_2^i}\right) < \left(e^{T_2^i} - 1\right),$$

which cannot be true, give the convexity of e^x. Therefore, if $R^i(MM) \geq R^i(MF) + s_k$, it still cannot be the case that an artist who starts in the fringe market will later switch to the mainstream. ■

B. Proof of Proposition 2

Suppose no artist will switch from the mainstream to the fringe in his career. Together with Proposition 1, this would imply that everyone either produces mainstream or fringe music (but not both) throughout his career. Supply in either market will adjust until an equilibrium is reached in which, for each type $i = H,L$, an artist with $\tilde{s}^{\,i}$ is just indifferent between the two careers (*M-M* and *F-F*), as represented in the following figure:

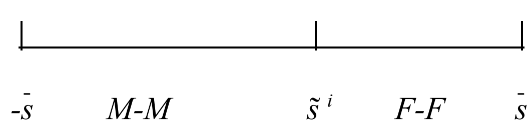


Figure A1.

$\tilde{s}^i$ is defined by:

$$R^i(F) + R^i(FF) + 2\tilde{s}^i = R^i(M) + R^i(MM),$$

or $$2\tilde{s}^i = \left(R^i(M) - R^i(F)\right) + \left(e^{R^i(M)}R^i(M) - e^{R^i(F)}R^i(F)\right)$$

for $i = H,L$. Those with $s > \tilde{s}^i$ will play fringe music throughout his career, while those with $s < \tilde{s}^i$ will play mainstream music. The proportion of artists in the two markets will depend on the relative magnitude of $R^i(M)$ and $R^i(F)$. Since s is distributed symmetrically around zero by assumption, there will be more artists in the mainstream than in the fringe market (i.e. $\tilde{s}^i > 0$) iff $R^i(M) > R^i(F)$. The opposite is true iff $R^i(M) < R^i(F)$. But the latter is impossible, since it would imply that there will be more artists in a smaller market (F) while each enjoys a higher demand than artists in the larger mainstream market. Therefore, we can conclude that $R^i(M) > R^i(F)$ and $\tilde{s}^i > 0$.

The marginal artist is indifferent between the two markets. By assumption he also has no incentive to switch from one market to another in the second period. Therefore, the following conditions must hold:

$$R^i(FF) + \tilde{s}^i > R^i(FM),$$

and $$R^i(MM) > R^i(MF) + \tilde{s}^i \quad .$$

Adding the two and simplifying using equations (5), (6), (8) and (9) gives

$$\left(e^{R^i(M)} - e^{R^i(F)}\right)T_2^i > \left(e^{R^i(M)} - e^{R^i(F)}\right) R^i(F),$$

or $$T_2^i > R^i(F),$$

since $R^i(M) > R^i(F)$ from above. A comparison of equations (4) and (7) shows that a necessary condition for this is that $\gamma > 1 - \gamma$. Therefore, if $\gamma < 0.5$, there will always be some artists who will switch from the mainstream to the fringe market in the second period of their careers. ■

C. Proof of Proposition 3

By the definition of $\tilde{s}_1^i$,

$$R^i(M) + R^i(MF) = \tilde{s}_1^i + R^i(F) + R^i(FF)$$

for $i = H,L$. Therefore,

$$\begin{aligned} \tilde{s}_1^H - \tilde{s}_1^L = & \left(R^H(M) - R^H(F) + R^H(MF) - R^H(FF)\right) \\ & - \left(R^L(M) - R^L(F) + R^L(MF) - R^L(FF)\right) \end{aligned} \tag{A7}$$

Let $d = e^{(q^H - q^L)} > 1$. Then, using equations (4), (5), (7), (8) and (9), equation (A7) can be simplified to

$$\begin{aligned} \tilde{s}_1^H - \tilde{s}_1^L = & (d-1)\left(R^L(M) - R^L(F)\right) \\ & + R^L(F)\left\{d\left(e^{dR^L(M)} - e^{dR^L(F)}\right) - \left(e^{R^L(M)} - e^{R^L(F)}\right)\right\} \end{aligned}.$$

Therefore $\tilde{s}_1^H \gtrless \tilde{s}_1^L$ iff $R^L(M) \gtrless R^L(F)$. Suppose $R^L(F) > R^L(M) = T_1^L + T_2^L > T_1^L$. Then,

$$\tilde{s}_1^L = \left(R^L(M) - R^L(F)\right) + R^L(F)\left(e^{R^L(M)} - e^{R^L(F)}\right) < 0.$$

Similarly, it can be shown that $\tilde{s}_1^H < 0$. Since $\tilde{s}_2^i < \tilde{s}_1^i$, it must follow that $G(\tilde{s}_2^i) < G(\tilde{s}_1^i) < 0.5$ for $i = H,L$.

From equations (10) and (12), if $R^L(F) > R^L(M) > T_1^L$, then the denominator of $R^L(F)$ must be less than the denominator of T_1^L:

$$\left\{\left((1+e^{R^L(F)})(1-G(\tilde{s}_1^{\,L})\right)+\left(G(\tilde{s}_1^{\,L})-G(\tilde{s}_2^{\,L})e^{R^L(M)}\right)\right\}n^L e^{q^L}$$
$$+\left\{\left((1+e^{R^H(F)})(1-G(\tilde{s}_1^{\,H})\right)+\left(G(\tilde{s}_1^{\,H})-G(\tilde{s}_2^{\,H})e^{R^H(M)}\right)\right\}n^H e^{q^H}$$
$$<\left\{G(\tilde{s}_1^{\,L})+G(\tilde{s}_2^{\,L})\right\}n^L e^{q^L}+\left\{G(\tilde{s}_1^{\,H})+G(\tilde{s}_2^{\,H})\right\}n^H e^{q^H}$$

After rearranging, this implies

$$\left\{\left((1+e^{R^L(F)})(1-2G(\tilde{s}_1^{\,L})\right)+\left(e^{R^L(F)}G(\tilde{s}_1^{\,L})-G(\tilde{s}_2^{\,L})\right)+\left(G(\tilde{s}_1^{\,L})-G(\tilde{s}_2^{\,L})e^{R^L(M)}\right)\right\}n^L e^{q^L}$$
$$+\left\{\left((1+e^{R^H(F)})(1-2G(\tilde{s}_1^{\,H})\right)+\left(e^{R^H(F)}G(\tilde{s}_1^{\,H})-G(\tilde{s}_2^{\,H})\right)+\left(G(\tilde{s}_1^{\,H})-G(\tilde{s}_2^{\,H})e^{R^H(M)}\right)\right\}n^H e^{q^H}$$
$$<0$$

which is impossible, since each of the groups of terms in brackets is positive. Therefore, it cannot be the case that $R^L(F) > R^L(M)$. Rather, $R^i(M) > R^i(F)$, so that $\tilde{s}_1^H > \tilde{s}_1^L > 0$ and $G(\tilde{s}_1^H) > G(\tilde{s}_1^L) > 0.5$, i.e. a higher percentage of the more talented artists will start their careers in the larger (mainstream) market.■

D. Proof of Proposition 4

The probability of a type i artist switching from market M in the first period to market F in the second period is given by $G(\tilde{s}_1^i)$ - $G(\tilde{s}_2^i)$. If s is uniformly distributed, then this probability is proportional to $\tilde{s}_1^i$ - $\tilde{s}_2^i$. Using the definition of $\tilde{s}_t^i$, for $i = H,L$, $t = 1,2$,

$$\tilde{s}_1^{\,i}-\tilde{s}_2^{\,i}=R^i(M)-R^i(F)+R^i(MF)-R^i(FF)-R^i(MM)+R^i(MF)$$

which can be simplified to

$$\tilde{s}_1^{\,i}-\tilde{s}_2^{\,i}=\left(R^i(F)-T_2^i\right)\left(e^{R^i(M)}-1\right)+R^i(F)\left(e^{R^i(M)}-e^{R^i(F)}\right). \qquad \text{(A8)}$$

It has been established in the proof of Proposition 1 that $R^i(M) > R^i(F)$. Therefore, the above expression is positive if $R^i(F) > T_2^i$.

Suppose $R^i(F) < T_2^i$. Then, by definition of $\tilde{s}_2^i$,

$$s_2^i = R^i(MM) - R^i(MF) = T_1^i + e^{R^i(M)}\left(T_2^i - R^i(F)\right) > 0 .$$

This implies that there will be more old artists recording mainstream music than fringe music. Compare the equations for T_2^i and $R^i(F)$ (equations (11) and (12)). The denominator on the RHS of equation (12) can be rewritten as

$$\sum_{i=H,L}\left(G(\tilde{s}_1^i) - G(\tilde{s}_2^i)e^{R^i(M)}\right)n^i e^{q^i} + \sum_{i=H,L}\left(1 + e^{R^i(F)}\right)\left(1 - G(\tilde{s}_1^i)\right)n^i e^{q^i} . \qquad \text{(A9)}$$

Similarly, the denominator on the RHS of equation (11) can be rewritten as

$$\sum_{i=H,L}\left(G(\tilde{s}_2^i)e^{R^i(M)}\right)n^i e^{q^i} + \sum_{i=H,L}\left(G(\tilde{s}_1^i)\right)n^i e^{q^i} ,$$

or

$$\sum_{i=H,L}\left(G(\tilde{s}_1^i) - G(\tilde{s}_2^i)\right)n^i e^{q^i} + \sum_{i=H,L}\left(1 + e^{R^i(M)}\right)G(\tilde{s}_2^i)\, n^i e^{q^i} . \qquad \text{(A10)}$$

which is greater than (A9), since $R^i(M) > R^i(F)$ and $\tilde{s}_1^i > \tilde{s}_2^i > 0$. The numerator on the RHS of equation (12) is larger than that of equation (11), given our assumption that $(1 - \gamma) > \gamma$. So, $R^i(F)$ is larger than T_2^i, and we have a contradiction. Therefore, $R^i(F)$ cannot be smaller T_2^i.

Since $R^i(F) > T_2^i$, $\tilde{s}_1^i - \tilde{s}_2^i > 0$, and $G(\tilde{s}_1^i) - G(\tilde{s}_2^i) > 0$. Moreover, each of bracketed groups of terms on the RHS of equation (A8) is positive and larger for $i = H$ than for $i = L$. Therefore, $G(\tilde{s}_1^H) - G(\tilde{s}_2^H) > G(\tilde{s}_1^L) - G(\tilde{s}_2^L)$, and more talented artists have a higher propensity to switch from the mainstream market to the fringe market in the second period of their careers. ■

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