

Closure and Exposure:  
Mechanisms in the Intergenerational  
Transmission of Self-employment<sup>•</sup>

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## Abstract

Children of the self-employed are twice as likely as other children to enter into self-employment themselves. A variety of different mechanisms have been proposed to explain the intergenerational transmission of self-employment, but current empirical research has been unable to assess their empirical validity. I use unique life history data to examine the impact of parental self-employment on the transition to self-employment in Denmark and assess the different mechanisms identified in the literature. The results suggest that parental role modeling is an important source of the transmission of self-employment. However, there is little evidence to suggest that children of the self-employed enter self-employment because they have privileged access to their parent's financial or social capital, or because they have superior entrepreneurial abilities.

Family background has a dramatic impact on the likelihood of becoming self-employed. In particular, numerous studies find that having self-employed parents makes children substantially more likely to enter into self-employment themselves (Blau and Duncan 1967; Featherman and Hauser 1978; Hout 1984; Wong 1992; Western and Wright 1994; Aldrich, Renzulli and Langton 1998; Hout and Rosen 2000; Roberts 1991; Utterback et al., 1988). The magnitude of this effect is striking: using data on young men in the United States, for example, Dunn and Holtz-Eakin (2000) estimate that parental self-employment doubles the probability of entry into self-employment during the early career. Yet despite the voluminous evidence of the intergenerational transmission of self-employment, there remains substantial ambiguity concerning the precise mechanisms behind it (Aldrich, Renzulli and Langton 1998), just as there remains uncertainty as to the causes of social immobility more generally (Hout 1984).

Our limited understanding of the causes of transmission of self-employment reflects an identification problem in existing research: multiple theoretical accounts are consistent with the available empirical evidence. Broadly speaking, scholars have suggested two different types of reasons why children of the self-employed are more likely to become self-employed themselves, which I term “exposure” and “closure” arguments respectively. Exposure arguments draw on a large body of research highlighting the influence of parental status on socialization processes, focusing in particular on how the parents’ social position exposes children to experiences and normative expectations that have a lasting impact on their subsequent career choices

(e.g., Kohn, Slomczynski, and Schoenbach 1986; Sewell and Hauser 1975). Exposure to and familiarity with self-employment in the family of origin may raise self-employment rates by increasing both the perceived viability of self-employment as a career option (Carroll and Mosakowski 1987) and – by causing the child to acquire relevant skills – the actual viability of self-employment (Lentz and Laband 1990; Dunn and Holtz-Eakin 2000). A second line of argument emphasizes social closure processes (Parkin 1979). Authors in this tradition attribute the transmission of self-employment to the ability of some parents to take advantage of resources derived from their social position in order to secure their children’s status (Robinson 1984; Western and Wright 1994). Children of the self-employed may not necessarily be more likely than other children to *try* to enter self-employment (as in exposure arguments); rather, they may be more likely to *succeed* in entering self-employment, once they do try, by taking advantage of privileged access to their self-employed parents’ financial and social capital. In other words, self-employed parents may help their children overcome the barriers to entry into self-employment, and different rates of entry into self-employment would therefore reflect unequal access to valuable resources.

Past research makes it impossible to determine whether the transmission of self-employment is due to the operation of closure processes alone, exposure processes alone, or both. Yet establishing the relative merits of the closure and exposure accounts is important for several reasons. First, the closure and exposure arguments capture fundamentally different perspectives on the nature of stratification processes in modern societies in general, and of social mobility processes in particular. Closure theorists point to the transmission of self-employment and see the impact of exclusionary practices on

the part of self-employed parents in order to privilege their offspring. Exposure theorists look at the same empirical regularity and see evidence that social reproduction is a by-product of the familial environments created by parental self-employment. To complicate things further, both types of processes may be operating. Advancing our understanding therefore demands a new empirical approach that more directly tests the specific social mechanisms invoked in the closure and exposure accounts.

A more fine-grained understanding of the mechanisms behind the transmission of self-employment also promises to shed greater light on the nature of the entrepreneurial process. Entry into self-employment is a unique career transition that requires the ability to identify entrepreneurial opportunities, the mobilization of resources and the willingness to pursue risky ventures. The exposure and closure arguments speak to a fundamental question in the study of entrepreneurial activity, namely whether differences in individual propensities to enter self-employment reflect differences in access to entrepreneurial opportunities and resources, or differences in the ability and desire of individuals to pursue the opportunities that arise (Thornton 1999). Thus higher rates of self-employment among children of the self-employed can, in line with exposure arguments, be seen as indicative of the importance of entrepreneurial orientations or personality types (McClelland 1961) in the genesis of entrepreneurial activity. Others discount the importance of entrepreneurial personalities and, consistent with closure accounts, point instead to differences in the structure of opportunities for children of the self-employed (Aldrich and Zimmer 1986). And once again, the transmission of self-employment may be due to both types of processes.

The aim of this paper is to move beyond prior research and assess the degree of empirical support for the most commonly invoked mechanisms underlying the closure and exposure accounts. The failure of prior research to distinguish between the different mechanisms grows to a large extent out of the research designs typically employed. Past studies generally rely on data that measure parental social status at a single point in time during the child's life-course, usually at age sixteen (e.g., Blau and Duncan 1967; Featherman and Hauser 1978; Erikson and Goldthorpe 1992; Sewell and Hauser 1975). An association between parental self-employment at this time point and the subsequent likelihood of entering self-employment can be interpreted as a result of both socialization and resource transfer; the data allow no adjudication. Thus if one holds that aspirations and work values are shaped in late adolescence and early adulthood and remain largely fixed thereafter (Johnson 2002; Halaby 2003), then higher rates of self-employment can be seen as a manifestation of these early influences on children's career choices. However, parents who were self-employed when the children were sixteen are also more likely to be self-employed when the children are older; similarly, parents who were not self-employed at one stage of the life course are less likely to be self-employed at a later stage. The higher rates of self-employment among children of the self-employed may therefore reflect unmeasured differences in the ability of parents to facilitate their adult child's entry into self-employment.

Even if the self-employment status of parents and children were measured after the child reached adulthood, the interpretation of any association would remain ambiguous. For example, a self-employed parent may possess the resources needed to facilitate his or her child's entry into self-employment. But even if the parent does not

intervene on the child's behalf, he or she will – by virtue of occupying the position – expose the child to self-employment as a viable career option, and thereby potentially influence the child's aspirations and human capital investments.<sup>1</sup> In other words, parents cannot be in a position to transfer resources to their children without at the same time potentially changing their children's aspirations or human capital.

As this discussion suggests, disentangling the closure and exposure accounts empirically poses a substantial challenge and demands a different research design than found in prior research. In this paper, I use an unusually rich and comprehensive data set on the Danish population to deploy a unique longitudinal research design. This design allows me to assess the empirical support for the mechanisms underlying the closure and exposure accounts. I make several analytic advances over prior research. First, I exploit information on the timing of parental self-employment to determine whether exposure to parental self-employment during adolescence alone is sufficient to generate increased rates of entry into self-employment later in life. Individuals who only experience parental self-employment during adolescence and subsequently become self-employed themselves are less likely to have done so because their parents used their positional advantages to ease their entry. I am therefore able to present a test of the exposure argument that is not confounded with closure processes. Second, by enriching the set of parental characteristics considered, I am able to examine the extent to which children of the self-employed take advantage of access to their parents' financial and social capital to enter self-employment. Finally, by studying the post-entry performance of people who

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<sup>1</sup> This observation is not strictly true, but it is difficult to envision many common scenarios in which self-employed parents pass advantages along to their children without having some social contact with them.

become self-employed, I investigate whether there is evidence consistent with the idea that the children of the self-employed acquire skills relevant to self-employment.

To anticipate the findings, my analyses suggest that closure processes play a limited role at best in the transmission of self-employment in Denmark. There is no empirical support for the claim that self-employed parents facilitate their children's entry into self-employment through wealth transfers, and only limited evidence consistent with the idea that children of the self-employed draw advantages from their parents' industry knowledge and contacts. The evidence is more generally consistent with the operation of exposure processes. Most dramatically, self-employment rates among children whose parents were only self-employed during the child's adolescence are almost equal to the rates of children whose parents were continually self-employed. Furthermore, there is little evidence to suggest that this exposure effect operates through greater entrepreneurial abilities, since children of the self-employed do not have superior performance once they enter self-employment relative to other children. Rather, the results suggest that parental role modeling play a crucial role in generating the transmission of self-employment.

### Mechanisms in the transmission of self-employment

A review of the literature suggests that four distinct mechanisms are commonly invoked as explanations for the transmission of self-employment. These mechanisms can usefully be seen as drawing directly or indirectly from two classic approaches to theorizing about intergenerational mobility and stratification processes in modern



societies, although these mechanisms do not exhaust the possible arguments that could be advanced from each perspective. The exposure tradition, exemplified by status attainment research (Sewell and Hauser 1975; Hauser, Tsai and Sewell 1983) and research on work values (Kohn 1969; Kohn, Slomczynski and Schoenbach 1986) holds that the effects of social origins are mediated through their impacts on the aspirations and skills of class incumbents. In such accounts, position in the social structure has no independent causal effect on occupational attainment; instead, class reproduction results as a by-product of class-determined life conditions and their impact, through socialization processes, on children's aspirations and skills. The forces that influence aspirations and skills (such as parenting styles) are not necessarily unique to particular classes, but their uneven distribution through social structure may lead to class reproduction. The second major explanatory tradition in mobility research, exemplified by a variety of class perspectives, is more explicitly structural (e.g., Western and Wright 1994; Robinson 1984). Such closure perspectives (Parkin 1979) encompass mechanisms whereby class reproduction results from the exclusion of non-class members from the positions that generate advantage. These accounts locate the source of inequality in the characteristics of the positions that people occupy in the social structure and the advantages those positions convey, and not in individual preferences and abilities.

Two mechanisms emphasize the consequences of children's exposure to parental self-employment and suggest that the transmission of self-employment reflects the impact of this exposure for children's aspirations and for their acquisition of human capital, respectively (e.g., Carroll and Mosakowski 1987; Lentz and Laband 1990; Aldrich, Renzulli and Langton 1998). The remaining two mechanisms emphasize closure

processes, and posit that children of the self-employed benefit from superior access to the financial capital and social capital needed for entry into self-employment, respectively (e.g., Blau and Duncan 1967: 41; Western and Wright 1994; Aldrich, Renzulli and Langton 1998). I discuss each of these mechanisms in turn.

### *Aspirations*

A substantial portion of the intergenerational correlation in social status can be attributed to the impact of parental characteristics on children's aspirations and values (e.g., Sewell and Hauser 1975). Self-employed parents may serve as role models for their children (Carroll and Mosakowski 1987; Hout 1984). This role modeling may simply serve to legitimate or increase the child's awareness of self-employment "as a realistic alternative to conventional employment" (Carroll and Mosakowski 1987: 576), and thus increase the possibility that the child will consider self-employment a viable career option later in life.<sup>2</sup> Parental self-employment may also affect children's values by shaping their basic orientation toward "what makes up 'earning a good living'" (Hout 1984: 1384), leading to a preference for self-employment among children of the self-employed (Western and Wright 1994; Aldrich, Renzulli and Langton 1998). Furthermore, the child-rearing practices and values of self-employed parents may lead their children to value self-employment more highly than other forms of employment. The extensive work by Kohn and others (Kohn 1969; Spenner 1988) suggests that people whose work is characterized by high levels of self-direction develop values that emphasize the

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<sup>2</sup> One could, in a similar vein, also argue that the effect of role modeling by the parent consists in limiting the range of career choices that seem viable to the child; children of professors may have little sense of the alternative. The implications for the transmission of self-employment are the same.

importance of self-direction and autonomy, and that that parental values in turn affect children's values (Kohn, Slomczynski and Schoenbach 1986). This suggests that children of the self-employed will value the autonomy and self-direction of self-employment more highly than children of parents with lower levels of occupational self-direction. Such a taste for autonomy may be an important factor in the decision to become self-employed. For example, the self-employed in the United States suffer a wage penalty relative to what they could earn in paid employment (Hamilton 2000) and accept lower risk-adjusted returns on their entrepreneurial investments (Moskovitz and Vissing-Jørgensen 2002). Both of these financial penalties can be viewed as a price that people pay for the autonomy of self-employment. Furthermore, Benz and Frey (2003), using cross-national surveys, find that autonomous work conditions explain the greater job satisfaction of the self-employed relative to the employed.

Halaby's (2003) analysis of data from the Wisconsin Longitudinal Survey (WLS) provides some support for this mechanism. The WLS has tracked a sample from the 1957 cohort of Wisconsin high school seniors, including a survey of job values performed in 1993. Halaby classifies some of these job values as indicating a more entrepreneurial orientation and others as indicating a more bureaucratic orientation (Miller and Swanson 1958). His analyses suggest that the children of fathers who were self-employed in 1957 are more likely to express entrepreneurial job values in 1993 than other children. For example, grown children of the self-employed are significantly more likely to express a preference for jobs offering autonomy relative to jobs offering a pension. However, while Halaby (2003) focuses on the determinants of entrepreneurial job values, he does not focus explicitly on the process of entry into self-employment. It

is therefore unclear whether the inheritance of self-employment is mediated by job values. Furthermore, the fact that the WLS did not collect information on job values prior to 1993 calls the causal ordering of the relationship between father's self-employment and child's job values into question; parental self-employment may have led children to enter self-employment and then subsequently develop entrepreneurial job values.

### *Entrepreneurial skills*

More so than sociologists, economists have emphasized the consequences of exposure to parental self-employment during childhood and adolescence for the development of human capital, particularly the broad portfolio of skills relevant to self-employment. Because the potential returns to an entrepreneurial opportunity depend in part on the entrepreneur's ability, those with greater entrepreneurial skills can expect higher returns on average and should therefore be more likely to enter into self-employment (Dunn and Holtz-Eakin 2000). Some of these skills may be acquired through observation of the parent engaged in self-employment, but the more commonly emphasized channel is through work experience in the family firm (Carroll and Mosakowski 1987). For example, in their study of Canadian entrepreneurs, Aldrich, Renzulli and Langton (1998) found that 61% of those whose parents had been self-employed had worked in their parents' business; over half of these had started working for their parents before they were 15.

Lentz and Laband (1990: 564) argue that children of the self-employed acquire valuable human capital about running a business

as a by-product of growing up. By the time he reaches the age of, say, eighteen, when most other youths his age are just starting to acquire job-specific skills ... or more general occupational skills ... the son of a proprietor normally has already had an opportunity to acquire the equivalent of an integrated, managerial education.

Similarly, Dunn and Holtz-Eakin (2000) suggest that because the children of the self-employed benefit from the transfer of “family-specific capital” and skills, they have greater entrepreneurial abilities than children whose parents are not self-employed. As a result of these differences in skill acquisition, the higher rates of self-employment among children of the self-employed may be explained by their superior expected returns from entrepreneurial opportunities.

### *Financial capital*

Turning to closure processes, many sociologists have argued that the transfer of property or capital lies at the root of the inheritance of self-employment, either through the direct transfer of an ongoing business from one generation to the next, or through the ability of self-employed parents to fund their children’s ventures. For example, Western and Wright (1994: 611) argue that “parental ownership of property is ... ‘insurance’ against downward mobility into wage labor for the offspring of capitalists, and the requirement of capital ownership is a barrier to entry for the children of most employees.” Similarly, in seeking to explain the intergenerational reproduction of class advantage, Robinson (1984: 183) argues that “parents can simply give or will their business to their children or provide them with investment capital to start their own business.” Hout (1984: 1385) argues that “although most men would like to help their sons, ready access to cash and credit is one of the fruits of autonomy,” making it easier

for self-employed parents to help their children enter self-employment<sup>3</sup> (see also Dunn and Holtz-Eakin 2000).

The simplest means by which parents can facilitate their children's entry into self-employment is by allowing their children to take over their on-going ventures. However, this accounts for only a very small proportion of the intergenerational inheritance of self-employment; for evidence, see below, as well as Aldrich, Renzulli and Langton (1998). Absent this type of transfer, the ability of parents to provide capital to their children should depend on their wealth. The financial transfer hypothesis therefore implies that self-employment rates should be a positive function of parental wealth.

### *Social capital*

While some analyses of entry into self-employment demonstrate that potential entrepreneurs face capital constraints (Evans and Leighton 1989; Holtz-Eakin, Joulfaian and Rosen 1994; Dunn and Holtz-Eakin 2000), these constraints are not sufficiently binding to make access to financial capital a necessary condition for entry into self-employment (Hurst and Lusardi 2003; Aldrich, Renzulli and Langton 1998). More importantly, access to capital is by no means a sufficient condition for entry into self-employment. Successful entrepreneurial entry also requires the recognition of valuable entrepreneurial opportunities, and the ability to mobilize resources other than money to take advantage of them (Stinchcombe 1965; Aldrich and Zimmer 1986). Herein lies a second potential source of closure fostering the intergenerational inheritance of self-employment, namely the social capital of self-employed parents. The children of self-

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<sup>3</sup> It is not entirely clear from Hout's discussion why job autonomy per se should lead to superior access to capital, except that autonomy is a consequence of ownership.

employed parents may enter self-employment at higher rates because they have better access – through their parents – to knowledge about entrepreneurial opportunities. By virtue of the social networks developed through their own entrepreneurial activity, self-employed parents may be exposed to more and/or better information about new market opportunities. Even if self-employed parents are not exposed to more or better entrepreneurial opportunities than conventionally employed parents, self-employed parents may be better able to assess the attractiveness of the opportunities, and pass that knowledge along to their children. Furthermore, self-employed parents may be better able to provide their children with referrals to suppliers of critical resources as well as potential customers, thereby easing the transition to entrepreneurship.

All four of these mechanisms imply a positive correlation between rates of self-employment and parental self-employment status. Progress in assessing the merits of the different mechanisms in a given empirical context therefore requires deriving and testing additional implications of the different mechanisms. I discuss the analytic strategy next, along with the implied hypotheses.

### Hypotheses

I begin with a strategy for identifying an effect of parental self-employment that does not confound the potential effects of exposure processes with the two closure mechanisms. The key to doing so is to exploit data on the timing of parental self-employment relative to the child's life course, because the range of parental influences depends on the timing of parental self-employment. Conventional mobility studies measure parental status at a single point in time (typically late adolescence) and its

correlation with the child's status at some later point in time. This measurement strategy obscures heterogeneity in parental career trajectories subsequent to the child's adolescence; propelled by the imperatives of their own careers, parents may move in and out of different social positions while their children build their own careers. If the primary source of intergenerational immobility lies in the lasting effects of parental status on children's aspirations and skills, and parental influence diminishes rapidly after adolescence, then the fact that parents may change status later in life is largely irrelevant. If, by contrast, intergenerational immobility is a result of parents exploiting their positional resources to benefit their children, then whether or not parents occupy a position at a given point in time is a critical issue. In particular, parents must occupy the position in question when their children are seeking entry.

Information on the timing of parental self-employment can therefore be used to gain a better understanding of the nature of intergenerational influence. Figure 1 identifies four different simplified trajectories of parental self-employment during the child's life course.<sup>4</sup> The rows of Figure 1 differentiate parents according to their self-employment status before the child completed compulsory schooling, and hence before the child was at risk of entering self-employment (termed "Adolescence" for convenience). During this period, children are socialized by their parents and might work in their parents' business. The columns classify parents by their self-employment status after the child has completed compulsory schooling and is capable of entering self-employment (termed "Adulthood"). Parental self-employment during this period may

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<sup>4</sup> The classification in Figure 1 could be elaborated with more fine-grained information on the timing of parental self-employment, but for analytic purposes here the key issue is the timing of self-employment relative to the completion of compulsory schooling.



also influence children's aspirations and skills, although the parental impact on aspirations and work values is weaker than earlier in the life course (Vollebergh, Idema and Raaijmakers 2001). More importantly for analytic purposes, the fact that the children are at risk of entering self-employment during this stage of the life course opens up the possibility that self-employed parents can ease their entry by exploiting their positional advantages.<sup>5</sup>

The cells on the main diagonal of Figure 1 represent the simplest parental trajectories, where parents have been either continuously self-employed or never self-employed during the child's life course. Higher rates of self-employment by children of continuously self-employed parents may reflect either the influence of exposure processes, or the exercise of positional advantage, or both. The more analytically interesting trajectories are found in the off-diagonal cells. The lower-left hand cell contains parents who were not self-employed while their children were growing up, but who entered self-employment subsequent to their children's completion of compulsory schooling. These parents could in principle facilitate their children's entry into self-employment through the transfer of positional resources. However, because their entry into self-employment may reflect a long-held ambition, these parents may also have caused their children to acquire entrepreneurial job values and aspirations. This cell therefore does not allow one to cleanly adjudicate between accounts emphasizing the role of exposure to parental self-employment and accounts emphasizing positional advantage.

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<sup>5</sup> Parents who are not self-employed when the children are at risk of entering self-employment may have other resources that they can use to facilitate their children's entry, but these resources are by definition not rooted in positional advantages associated with being self-employed.

Greater analytic traction can be gained from the upper-right hand cell in Figure 1, which contains parents who were self-employed as their children were maturing, but who subsequently exited self-employment. Children in this cell may acquire entrepreneurial aspirations and skills while growing up, but when they reach adulthood their parents, having left self-employment, can no longer exploit their positional resources to benefit the children.<sup>6</sup> If exposure to parental self-employment is not implicated in the transmission of self-employment, the entry rates of these children should be the same as those whose parents were never self-employed. If their rates of entry are higher, it suggests that exposure to parental self-employment leads to entrepreneurial aspirations and skills. Because the parents subsequently leave self-employment, any effect is less likely to be the result of the exercise of positional advantage by self-employed parents.

Hypothesis 1: Self-employment rates will be higher if parents were self-employed during the child's adolescence alone than if parents were never self-employed.

Support for Hypothesis 1 would suggest that exposure processes contribute to the transmission of self-employment, but would leave two questions unresolved. First, such evidence does not speak to the empirical merits of the closure mechanisms; resource transfers may complement exposure processes in generating the transmission of self-employment. Second, evidence consistent with Hypothesis 1 would not speak to whether the exposure effect is due to the impact of exposure on aspirations and work values, or to the acquisition of entrepreneurial skills, or both.

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<sup>6</sup> It is unlikely that the parents resources dissipate immediately after leaving self-employment, particularly if they have left self-employment because they have been very successful. I examine the destinations of those parents who left self-employment before their child's adulthood below.

The financial capital mechanism can be examined by estimating the effect of parental wealth on the transition to self-employment. Evidence for such an effect is mixed. Using a sample of entrepreneurs, Adlrich, Renzulli and Langton (1998) find no evidence to suggest that parental wealth was an important determinant of the likelihood of entering entrepreneurship. In the most careful study of this mechanism, Dunn and Holtz-Eakin (2000) use data from the National Longitudinal Survey of Market Experience (NLS) and find that parental assets have a positive effect on the self-employment rates of sons. However, the effect is substantively small, with a \$10,000 increase in parental assets (measured in constant 1982-1984 dollars) raising the probability of entry into self-employment by 0.0009, relative to an average transition probability in the sample of 0.031 (Dunn and Holtz-Eakin 2000: 298). The effect of parental assets is reduced slightly when a dummy variable for parental self-employment is included in the model. However, the effect of parental self-employment in Dunn and Holtz-Eakin's models is strong and positive after controlling for parental assets, suggesting that parental assets do not account for the intergenerational inheritance of self-employment.

Dunn and Holtz-Eakin's analyses can be considered a test of a weak-form version of the closure argument because they only estimate a main effect of parental assets.<sup>7</sup> This is consistent with the capital transfer hypothesis, provided that self-employed parents have greater wealth on average than non-self-employed parents. In

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<sup>7</sup> Dunn and Holtz-Eakin (2000) do estimate an interaction effect between parental self-employment and parents' business assets, finding that it has a significant, positive effect on the transition probability. However, they interpret this as a measure of the parents' success in self-employment. It is also somewhat difficult to interpret, since parents who are not self-employed by definition have no business assets. They provide no test of whether the effect of non-business assets is stronger for self-employed parents.

their data, self-employed parents do have higher assets, particularly when business assets are included. However, a stronger test of exclusionary behavior by self-employed parents would be to interact parental assets with parental self-employment. A positive interaction effect would indicate that self-employed parents are more likely to use their assets to help their children enter self-employment than are non-self-employed parents.

This reasoning suggests two hypotheses:

Hypothesis 2: The rate of entry into self-employment will be a positive function of parental assets.

Hypothesis 3: The positive effect of parental assets on the rate of entry into self-employment will be stronger if the parents are self-employed.

Parental social capital is considerably more difficult to measure than financial assets, particularly when one considers that an appropriate measure would have to capture those aspects of a parental social networks and reputation that are relevant to entrepreneurial activity. I therefore rely on an indirect test of the social capital mechanism. If it is the case that self-employed parents use their business knowledge and contacts to help their children enter self-employment, then the children of the self-employed should be more likely to start a new venture in the same industry as their parents than they would be to start a venture in a different industry. While it is unlikely that the parents' contacts are focused exclusively around their own industry, it is reasonable to assume that their social networks are more concentrated around their own industry and have greater potential value there. Particularly the ability of parents to identify and evaluate new entrepreneurial opportunities should be greatest in the industry in which they themselves work. This reasoning suggests that if the social capital

mechanism is operating, then the children of self-employed parents should be more likely to enter the same industry as their parents than they would be to enter self-employment in a different industry, where their parents' social capital will be less useful.

Hypothesis 4: Parental self-employment makes children more likely to choose self-employment in the same industry as their parent than self-employment in a different industry.

Finally, one way to differentiate between the two exposure mechanisms – in the absence of detailed data on aspirations and skills – is to shift the analytic focus away from the transition to self-employment and instead focus on the relative performance of the new ventures. In particular, if it is true that the children of the self-employed are more likely to enter self-employment because of their greater entrepreneurial ability, it follows that their performance while self-employed should be superior, on average, to the performance of self-employed individuals whose parents were never self-employed.

Hypothesis 5: Individuals with self-employed parents will be more successful in self-employment than individuals whose non-self-employed parents.

Aspirations could also lead to superior performance, if children of the self-employed are more committed to self-employment and therefore work harder. However, if there is no performance difference between the ventures of children of the self-employed and other children, it is difficult to argue that the children of the self-employed have acquired any skills. Such a null result would not, however, be inconsistent with the aspiration mechanism.

## Data and Methods

Disentangling the roles of the four exposure and closure mechanisms requires data not only on individual work histories during adulthood coupled with information on parental characteristics, but also data on parental characteristics prior to the child's entry into the labor market. Moreover, to avoid selecting on the dependent variable, individuals must be observed prior to entry into self-employment, and the data must allow the observation of transitions to self-employment from any of a variety of states, including employment, unemployment, schooling, etc. Finally, because the transition to self-employment is a rare event, a large sample size is needed to provide sufficient statistical power. Prior research on the transmission of self-employment in the United States has relied on matching data on parents and children from the National Longitudinal Surveys (Dunn and Holtz-Eakin 2000), but the resulting sample sizes are too small to reliably estimate the effects of different parental trajectories of self-employment.

With these constraints in mind, I turn to an unusually rich dataset describing the population of Denmark between 1980 and 1997. The Integrated Database for Labor Market Research, referred to by its Danish acronym, IDA (Integreret Database for Arbejdsmarkedsforskning), is drawn from population registers maintained by the Danish government. IDA has several advantages. First, it is comprehensive: all people (legally) living in Denmark in a given year are included in the registers. Individual characteristics are recorded in IDA on an annual basis, based on each individual's status in the 48<sup>th</sup> week of a given calendar year. IDA therefore amounts to an annual census of the population of Denmark. Second, IDA is longitudinal, with annual observations starting in 1980; as a

result, it contains panel data for individuals. Third, IDA covers a wide range of phenomena, especially with respect to labor market outcomes. Fourth, and most importantly, the design of IDA allows individuals to be linked according to a variety of relevant characteristics. For example, children can be linked to their parents; in addition, employees can be linked to their employers.

The comprehensive character of IDA makes confidentiality a primary concern, so Statistics Denmark (which maintains IDA) restricts access to IDA in a variety of ways. Most relevant in this context is the fact that researchers are not allowed unfettered access to IDA, but must instead request particular extracts from the larger database. The analyses reported in this paper come from a special extract commissioned as part of a larger research project designed to examine a variety of issues related to the dynamics of self-employment and entrepreneurship. This extract was created by identifying all individuals who were living in Denmark in 1994 and were between the ages of 15 and 74. This is a population of 3.9 million individuals. For all of these individuals, relevant information from IDA was collected for each year from 1980 until 1997. It should be noted that this design means that the extract only covers the entire population in 1994. In other years, the extract does not capture people who were not in the population in 1994, for example because they died or emigrated before 1994. This type of attrition is more serious for older cohorts, and does not pose concerns for the current analyses.

Data on individuals in IDA are truncated prior to 1980. This truncation is especially problematic with respect to analyzing entry into self-employment, since those who have entered self-employment once are substantially more likely to do so again. Left-truncation in 1980 means there is no information on prior self-employment

experience for people who were already in the labor market in 1980. Again, this limitation poses the greatest problems for older cohorts, since it is more likely that relevant career history information will be unobserved. As will be apparent, this left-truncation does not pose a problem in the analyses presented here, since individuals are sampled prior to labor market entry.

IDA contains rich demographic information and a wealth of labor market variables measured on a yearly basis. Demographic variables include age, sex, marital status, number of children, number of siblings in family of origin, birth order in family of origin, current school enrollment, and a highest educational level achieved. Current occupation for employees is recorded in broad categories, coded here as white collar vs. blue collar. Annual salary is recorded in constant 1980 Danish kroner, as is non-salary income. All income information comes from tax records. Furthermore, because Denmark had a wealth tax until 1996, individual tax records contain information on personal assets and liabilities. From this information, I created a measure of family net wealth by adding together the focal individual's net wealth and the net wealth of his or her spouse, if present.

Employees in IDA are linked to their primary workplace in a given year; workplaces are in turn linked to firms. Workplaces and firms are assigned unique identification numbers that are constant over time. Firms are in turn classified by industry using a 111-category aggregation of the ISIC (rev. 2) classification scheme. This workplace information allows me to calculate variables measuring industry tenure and tenure with an employer. In addition, I calculated a labor force experience measure



by determining the age at which an individual first had an annual income exceeding 15,000 Danish kroner (constant 1980 values).<sup>8</sup>

Each person's record in the data extracted from IDA contains limited time-varying information on their parents, specifically father's occupation, mother's occupation, father's wealth and mother's wealth. Where both parents are present, I compute their combined wealth. The parental occupation variables are used to create measures of parental self-employment, as discussed below.

### *Sample*

I selected for analysis all Danish-born children born in the years 1966, 1967 and 1968 who were residing in Denmark in 1994.<sup>9</sup> These children were therefore adolescents aged 12 to 14 in 1980, the first year of data in the IDA database. This resulting sample contains 228,372 individuals, of which the slight majority (51.2%) are male. These individuals are observed annually (contingent on being alive and resident in Denmark in a given year) until 1997.<sup>10</sup> As a result, the data set consists of life histories for three cohorts of adolescents observed until they are aged 29 to 31; in short, the data cover their early career histories. The choice of these birth cohorts was dictated by a tradeoff between wishing to observe children both when their values are susceptible to parental influence and prior to labor market entry, on the one hand, and the need to observe sufficiently long career histories to capture an appreciable number of transitions to self-

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<sup>8</sup> This corresponds to approximately \$5,000 in current (2004) values.

<sup>9</sup> As noted above, not all members of the original birth cohorts who were alive in 1980 are observed, since some of them left the population prior to 1994.

<sup>10</sup> The mean number of annual observations is 16.8, so very few life histories are truncated or incomplete.

employment. Research suggests that parents have their greatest influence on children's values during early- to mid-adolescence, and that the influence of parents declines after the age of 16 (Vollebergh, Iedema and Raaijmakers 2001). Furthermore, the fact that children are observed at age 16 is consistent with the design of the standard occupational mobility studies. While it would have been possible, by selecting from later birth cohorts, to observe children at younger ages, these children would have less labor market experience before the data are right-censored.

#### *Definition of self-employment*

I measure transitions to self-employment to include only transitions in which the self-employed individual employed other workers. The primary way of identifying transitions to self-employment is through the occupational codes assigned by Statistics Denmark. These codes make a distinction between two kinds of owners of privately held firms: those that are employers and those that have no employees but pay value-added tax (VAT). This latter category is very heterogeneous, largely because paying VAT is the minimum requirement for starting or running a firm. But this category also includes many people one might think of as independent contractors instead of entrepreneurs, and may capture individuals with marginal labor force attachments. Raising financial capital is less likely to be an issue for independent contractors, so the inclusion of these transitions would bias the analysis against the closure mechanisms. Furthermore, of the two categories of private self-employment, entry into VAT-payer status is more likely to be driven by "push" factors such as poor prospects for paid employment. I therefore did

not define transitions to VAT-payer status as transitions to self-employment.<sup>11</sup> However, separate transition-rate analyses that included VAT-payer status yielded very similar results to the estimates presented here (results available on request).

Statistics Denmark only assigns self-employment codes to individuals whose ventures are privately held or unincorporated. Entrepreneurs who start new incorporated ventures can only be identified indirectly since bureaucratic restrictions prevent the identification in IDA of the individuals filing for incorporation. However, the founders of an incorporated venture are typically among the employees of the new venture in the initial years. To identify these transitions, I therefore proceeded as follows. First, I identified new employers by comparing sequential years of the employer and workplace files. Second, these workplace identification numbers are matched against the individual data to identify all people who worked for a firm in November of the first year of its existence. I then examined the occupational codes assigned to these employees and identify those employees who are top managers. These individuals were considered the founders of the new venture.<sup>12</sup> This means that one venture may include several people entering self-employment at the same time.

Finally, I have attempted to exclude cases of direct inheritance of on-going ventures. This can only be done indirectly in IDA. For direct inheritance to occur, the

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<sup>11</sup> A further complication is that the difference between being an employer and being a VAT payer is simply a matter of whether one has any employees at the time when the data are “collected.” Individuals can transition back and forth between these two states. In particular someone who starts as a single-person business (VAT-payer) may add employees after having some success. To be conservative, I did not treat transitions from VAT-payer status to employer status as transitions to self-employment. In short, for private firms, only transitions to employer status from a non-self-employed state were treated as a change in state.

<sup>12</sup> This indirect approach will unavoidably contain some measurement error. Included among the problematic cases are: some top managers in the first year may have been hired by the true founders; the owners of a venture may simply provide capital and hire employees; the founders’ occupational codes may not indicate that they in top management.

child's entry into self-employment has to occur at the same time as the parent's exit, and the child's industry of self-employment must be the same as the parent's. I treat apparent transitions to self-employment that met these criteria as censored. This is a conservative standard, since these events could both occur without the parent transferring a venture to the child. By these criteria, direct inheritance accounts for only a small proportion of self-employment transitions. Among the transitions to self-employment by children of the self-employed, 7.9% may be due to direct inheritance.<sup>13</sup> Direct inheritance does not explain the inheritance of self-employment in Denmark.

#### *Definition of parental variables*

Yearly information on the father's and mother's occupations was used to determine the self-employment status of the parents. In addition to the aforementioned distinction between employers and VAT-payers, the occupational coding scheme identifies a variety of other types of self-employment, including assisting spouses, "time-limited" self-employed, self-employed with unemployment insurance, and miscellaneous self-employed. These additional categories of self-employment account for a small proportion total self-employment.<sup>14</sup> I coded parents as being self-employed in a given year if their occupational code indicated any of these forms of private self-employment.

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<sup>13</sup> There are 1,847 transitions into non-agricultural self-employment by individuals whose parents were self-employed during the child's adulthood; of these, 146 transitions occurred simultaneously with the parent's exit from self-employment in the same industry,

<sup>14</sup> As a share of all person-year spells in which an individual was in some form of self-employment, self-employment with unemployment insurance accounts for 3.6% of spells, "time-limited" self-employment 5.1% and assisting spouses 2.2%, with miscellaneous self-employment 0.2%. Employer status accounts for 24.5% of the self-employment spells, while VAT-payer status accounts for 60.5% of spells.

This definition of parental self-employment does not capture parents who found and run incorporated ventures. As noted earlier, in IDA one can only identify the founders of incorporated ventures indirectly, by assuming that the founders are among the top managers of the venture in its first year of existence. Parents may have already been self-employed when the children first come under observation in 1980, and so it is impossible to identify these examples. This implies that some parents who are considered employees in these analyses are actually self-employed.

Table 1 contains information on the parental trajectories of self-employment experienced by the three cohorts. In this table, and the subsequent analyses, the analytic break between adolescence and adulthood corresponds to the end of compulsory schooling at age 16, when children become at risk of entering self-employment. Almost 66% of the sample was never exposed to parental self-employment between entering the sample in early adolescence and leaving the sample because of entry into self-employment or censoring. Twenty-one percent had parents who were self-employed during both adolescence and adulthood, while only three percent were exposed to parental self-employment during adolescence alone.

#### *Definition of risk set*

For the analyses, I use a very simple definition of the risk set, i.e., of the population that could possibly enter into self-employment. The most important consideration is the structure of the educational system. In Denmark, schooling is compulsory until the completion of the 9<sup>th</sup> grade, at which point children are 16 years of age. After the completion of 9<sup>th</sup> grade, children can choose to continue their education in

a variety of ways, or they may end their schooling.<sup>15</sup> I treat the end of compulsory schooling as the point at which children become formally at risk of entering into self-employment. By contrast, Dunn and Holtz-Eakin (2000) consider individuals at risk in the first year following their last reported enrollment in school. However, post-compulsory schooling is best seen as a competing risk to entry into self-employment; the attractiveness of continued schooling is presumably affected by the relative attractiveness of self-employment. Defining the risk set as all those individuals who have completed compulsory schooling avoids this endogeneity. In the models estimated below, I control for current employment status and for current school enrollment.<sup>16</sup>

People leave the risk set either at the time of censoring in 1997 or after their initial entry into non-agricultural self-employment. The dependent variable is therefore the rate of initial entry into self-employment. People who have entered and exited self-employment are substantially more likely to attempt to re-enter self-employment. Such serial entrepreneurship is likely due in part to a set of mechanisms caused by the experience of self-employment, such as the development of entrepreneurial networks, reputation and skills, as well as the possible strengthening of entrepreneurial job values. This suggests that the analysis of initial entry into self-employment should not be confounded with the analysis of subsequent entry. While it would be interesting to examine the potential moderating effects of parental self-employment on these factors, such as analysis is beyond the scope of this paper.

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<sup>15</sup> The two primary paths of further education are vocational and academic upper secondary schools, although a substantial proportion of children complete an additional year (10<sup>th</sup> grade) in lower secondary school before pursuing further education or ending their formal education.

<sup>16</sup> Almost all forms of schooling through graduate education are paid for by the state, including generous stipends for students not living with their parents.

## *Methods*

I analyze the hazard rate of entry into non-agricultural self-employment using discrete-time event history methods. Specifically, I estimate logistic regression models where the dependent variable is a dummy variable indicating entry into self-employment. I include dummy variables for distinct two-year intervals to allow the baseline hazard rate to vary with duration at risk.<sup>17</sup> All time-varying covariates are lagged one year and updated on an annual basis.

## Results

I begin by providing some descriptive information on self-employment in Denmark. As indicated by Table 2, the self-employed account for between seven and eight percent of the non-agricultural labor force, placing Denmark in the middle of the range of OECD countries. Self-employment rates have declined from approximately thirteen percent since the 1960s, but leveled off in the 1980s (Blanchflower 2000). Studies of entrepreneurs in Denmark suggest that very few people feel “pushed” into self-employment. Hancock and Bager (2001) report that 83% of respondents who were starting a business said they did so because they had identified a valuable opportunity, while only 5.4% felt that they had had no better choice available to them. This likely reflects the existence of a strong social safety net, including relatively generous

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<sup>17</sup> I also estimated piece-wise constant (continuous-time) hazard rate models and Weibull models. Not surprisingly, the estimates for the piece-wise constant models were practically indistinguishable from the logistic regression results. However, estimation times were considerably longer. The piecewise specification (using logistic regression) is preferable to the Weibull model, since the pattern of duration dependence appears to be non-monotonic.

unemployment benefits that increase the reservation wages of the unemployed (Westergaard-Nielsen 2001).

Of the 228,372 individuals in the three birth cohorts, a total of 4,399, or 1.9%, became employers at least once during the observation period. Of these transitions, 475 were cases of entry into self-employment in the primary sector (agriculture, fishing), so the proportion of the sample that ever entered into non-agricultural self-employment was 1.7% (3,934/228,453).

Figure 2 presents Kaplan-Meier estimates of the survivor function for first entry into non-agricultural self-employment. The figure clearly demonstrates the impact of parental self-employment on the entry rate. The survivor function for children whose parents have never been self-employed is considerably flatter than for children whose parents were ever self-employed, reflecting a substantially lower rate of self-employment.<sup>18</sup> The clear separation of the confidence intervals reflects the fact that these differences are statistically significant. Figure 3 presents estimates of the transition rate by parental self-employment experience and sex. For both men and women, parental self-employment has a dramatic effect. Among men, the rate more than doubles from 1.3 to 2.8 transitions per 1,000 person-years at risk; among women, the rate increases by over 80%.

Having established that the children of self-employed parents differ from other children in their propensity to enter into self-employment, I now consider whether they differ in terms of two other easily observable characteristics: age of first wage experience

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<sup>18</sup> “Never” and “ever,” when referring to parental self-employment, refer to their employment histories after 1980, when the IDA data begin. It is therefore possible that children whose parents are categorized here as never self-employed were in fact self-employed prior to the child’s adolescence.



and highest level of completed schooling. Figure 4 graphs the cumulative proportion of the sample who first earned at least 15,000 Danish kroner in annual income at each age according to whether or not parents were self-employed during the child's adolescence. The lines for the two categories of parental self-employment experience overlap almost perfectly, suggesting that parental self-employment during adolescence does not have much of an impact, if any, on the timing of labor force entry.

Table 3 presents the educational distributions according to sex and parental self-employment during the child's adolescence. The figures in this table refer to the highest level of schooling completed before the end of the observation period, when members of the cohort were between the ages of 29 and 31. There are no dramatic differences in the educational distributions according to parental self-employment. Children of the self-employed appear somewhat more likely to have pursued a vocational track than an academic track after the completion of compulsory schooling. To the extent that most forms of self-employment rely on vocational skills, this pattern is consistent with the idea that parents influence children's aspirations for self-employment and that schooling choices reflect those aspirations.

In summary, while the children of the self-employed differ dramatically from other children in their propensity to enter into self-employment, these differences are generally not reflected in the timing of labor market entry or schooling decisions. I turn now to a consideration of the four mechanisms representing closure and exposure processes.

Figure 5 presents a simple test of Hypothesis 1 by contrasting individuals whose exposure to parental self-employment was limited to their adolescence with those whose

parents were never self-employed. If exposure processes are implicated in the transmission of self-employment, then these children of the self-employed should have higher rates of entry (and steeper survival curves). Moreover, because these parents left self-employment before their children could try to enter, closure processes are unlikely to be implicated in such an effect. The evidence in Figure 5 is consistent with Hypothesis 1: exposure to self-employment during adolescence alone is sufficient to generate higher rates of entry into self-employment.

Multivariate models of the transition to self-employment corroborate this finding. Table 4 contains estimates of the effects of parental self-employment from a series of logistic regression models of entry into non-agricultural self-employment that control for a host of demographic and labor market variables. To account for historical variations in entry rates, I control for the state of the economy (Gross National Product and GNP growth) and average consumer sentiment as measured by consumer surveys performed by Statistics Denmark. I also control for demographics characteristics of the family of origin (number of siblings in the family of origin, whether a person was the first-born child, and a dummy variable if both parents are deceased) and the family of procreation (marital status, number of children, spousal employment status); schooling (a dummy variable for current school enrollment, and time-varying measures of the highest education completed); labor market variables (occupation, a summary measure of the degree of unemployment experienced over the past year, wage experience, industry experience, firm tenure, and log annual salary) and non-salary income. Finally, I include

(logged) three-year moving averages of family assets and family debts computed from information on the wealth of individuals and their spouses if present.<sup>19</sup>

Table 4 contains estimates of the effects of parental self-employment during different stages of the child's life course. As expected, parental self-employment at any stage has a substantial impact on the transition rate. The estimates in the last column of Table 4 capture the effects of the different trajectories of parental self-employment identified in Figure 1 with three dummy variables representing the different trajectories of parental self-employment. Hypothesis 1 is again supported: net of a host of relevant control variables, exposure to parental self-employment during adolescence alone is sufficient to generate a substantial increase in the rate of self-employment. The point estimate suggests that individuals exposed to parental self-employment during adolescence alone have a 53% ( $\exp(0.422)$ ) higher rate of entry into self-employment than individuals whose parents were never self-employed.

The estimates in Table 4 also demonstrate that exposure to parental self-employment during adolescence is not a necessary condition for generating higher rates of entry. Individuals who were adults by the time their parents entered self-employment have an entry rate that is 67% ( $\exp(0.517)$ ) higher than individuals whose parents were never self-employed. While this effect is somewhat larger than the effect for exposure during adolescence alone, this difference is not statistically reliable ( $\chi^2 = 0.89$ ,  $p < 0.35$ ). Finally, having continuously self-employed parents results in the highest entry rate, increasing the probability of entering self-employment by 84% ( $\exp(0.612)$ ). The effect of continuous parental self-employment is statistically different from the effect of

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<sup>19</sup> For individuals with zero assets or debts, I add 1 kroner before taking the log.

parental self-employment during adolescence alone ( $\chi^2 = 4.31, p < 0.04$ ), but not statistically different from self-employment during adulthood alone ( $\chi^2 = 2.63, p < 0.11$ ).

While this evidence seems generally consistent with Hypothesis 1, there is a simple objection from the standpoint of the closure arguments: it seems unreasonable to assume that any positional advantages that parents derive from self-employment should disappear immediately upon their departure from self-employment. For example, parents may leave self-employment because they have been very successful and accumulated substantial wealth; this would put them in a position to help their children start their own ventures. Similarly, the social capital that the parents accumulated during self-employment likely does not disappear immediately upon their exit.

I investigate this issue in several ways. First, Figure 6 presents information on the wealth of parents in the sample according to the trajectory of parental self-employment. I use the three-year moving average of the sum of the mother's and father's wealth as reported on their tax returns. The mean and median values of parental wealth are calculated over the time period when the children were in the risk set for entering into self-employment. There is little evidence to suggest that the parents who left self-employment after their child's adolescence did so because they had amassed substantial resources. Their mean wealth is approximately the same as parents who were never self-employed, while the median wealth is approximately half as large. Parents who are continuously self-employed do however appear to be more successful, with higher mean and median wealth. It is difficult to argue, based on this data, that the higher transition rate among people exposed to self-employment during adolescence alone can be attributed to the transfer of financial capital.

Table 5 further investigates whether the parents who left self-employment after the child's adolescence are likely to be in a position to pass on resources to their children. Table 5 characterizes these parents by their employment status in the year following their last observed year in self-employment. In general, their labor market behavior does not suggest that they left self-employment because they were very successful. The vast majority are still in the labor market: two-thirds of the parents who left self-employment were employed a year later, and an additional 16% were registered as unemployed. These parents generally did not take jobs that one would see as an attractive alternative to successful self-employment: of those who were employed, two-thirds found employment in lower white collar or unskilled blue collar jobs. Moreover, the new jobs do not appear to take advantage of any parental knowledge and contacts in the industry of self-employment, as only 3% of the parents find upper white collar positions in the same industry.

Table 6 presents estimates of the effect of parental self-employment from models that include a measure of parental wealth (divided by 100,000 for presentational purposes). Parental wealth generally does not have an effect on the rate of entry into self-employment. None of the models in Table 6, including the various interaction effects of parental wealth with parental self-employment history, improve significantly over the final model in Table 4. Furthermore, the inclusion of the parental wealth measure does not change the substantive conclusions regarding the effects of parental self-employment; while the magnitude of the impact of parental self-employment is reduced, the difference is trivial. We can therefore reject both Hypothesis 2 and Hypothesis 3: differences between self-employed and non-self-employed parents in wealth, or in the effect of

parental wealth, cannot account for the intergenerational inheritance of self-employment. On the other hand, Hypothesis 1 still cannot be rejected after controlling for parental wealth.

The inheritance of self-employment may still be due to closure processes if self-employed parents ease their children's entry by transferring them social capital. If parents are transferring social capital – in the form of entrepreneurially relevant knowledge and contacts – then this should manifest itself in the child's choice of industry to enter. Specifically, children of the self-employed should be more likely to enter their parent's industry than other children (Hypothesis 4). I model industry choice as a function of two factors. The first is an individual's own work experience prior to entry into self-employment. If children worked in their parent's industry prior to becoming self-employed, their choice of industry may reflect knowledge and contacts derived from their own work experience. The second factor is parental self-employment status, which allows me to determine whether children of the self-employed have an excess tendency to enter the same industry as their parents. Employed parents serve as a baseline group in this case; they can also transmit knowledge about their industry of employment to their children, and lead their children to enter self-employment in their industry. If children of self-employed parents have an excess tendency to choose their parent's industry when entering self-employment, then it would suggest that self-employed parents facilitate their children's entry into self-employment.

Table 7 presents the results of two different modeling strategies for assessing whether children of the self-employed have a greater tendency to enter their parent's industry. Panel A contains estimates from a competing risk model, where I estimated the

determinants of entry into self-employment into either the same industry as a parent's current employment or self-employment, or into a different industry. (These models in contain the full set of covariates in the models in Table 4.) Panel B presents the results of logistic regression models of the likelihood that a new venture is in the same industry as one of the founder's parents.<sup>20</sup> The results across the two estimation strategies parallel each other, with the differences in the coefficient estimates for a given variable across the competing risks largely reflected in the logistic regression estimates. However, it is important to note in Panel A that parental self-employment has a substantial positive effect on the likelihood of entering self-employment in a different industry than the parents. Parental social capital, as operationalized here, therefore cannot explain away the transmission of self-employment; children of the self-employed are much more likely to enter self-employment than other children, even if they do not take advantage of their parent's industry knowledge.

Nonetheless, parental self-employment does influence industry choice. The combined effects of prior industry of employment and parental self-employment status are summarized in Table 8, using estimates from the second logistic regression model in Panel B of Table 7. The baseline category in this model are people without prior work experience in the parent's industry and with employed parents. Comparatively, these individuals should have the least access to entrepreneurial knowledge and contacts in the parent's industry. Indeed, we see from Table 8 that they are the least likely to enter into self-employment in their parent's industry (conditional on entering self-employment). In

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<sup>20</sup> In cases where the pattern of duration dependence is the same for both competing risks, a competing risks model can be estimated as two models: a hazard rate model of the likelihood of changing state, and a logit (or probit) model of which state was chosen, conditional on an event occurring (Petersen 1995).

the top right-hand cell of Table 8 we see that prior work experience in an employed parent's industry makes it much more likely that an individual will choose that industry (multiplier of  $\exp(2.035)=7.65$ ). This suggests that people are more likely to pursue entrepreneurial opportunities in industries where they have experience. For individuals who cannot draw on their own work experience, having a self-employed parent almost triples the likelihood that they will choose to enter the parent's industry, relative to the baseline category ( $\exp(1.045)=2.84$ ). This suggests that self-employed parents more effectively transmit knowledge about entrepreneurial opportunities and contacts to their children outside the industry than employed parents, consistent with Hypothesis 4. Finally, a comparison of the net effects in the top row of Table 8 suggests that a self-employed parent adds something above and beyond their employed child's own knowledge of the common industry. Individuals with prior work experience in their parent's industry as 54% more likely to choose that industry if their parent is self-employed than if their parent is employed, further supporting the idea that the social capital of self-employed parents influences the industry choice of their children when they enter self-employment.<sup>21</sup>

It is interesting to note that access to parental financial capital appears to lower the likelihood of entering the same industry as the parent, as evidenced by the negative effect of parental wealth in Table 7. In combination with the results from Table 6, it appears that while parental wealth does not influence the rate of entry into self-employment in general, it does influence the choice of industry; as parental wealth

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<sup>21</sup> The results also indicate that an individual's own work experience is a partial substitute for the social capital of a self-employed parent. This can be seen in the fact that an individual's own work experience in the parent's industry has a smaller effect if the parent is self-employed than if the parent is employed.



increases, children who choose to become self-employed appear to venture further afield. However, this effect is substantively quite modest: a movement from the median of parental wealth to the 75<sup>th</sup> percentile (among those who entered self-employment) reduces the likelihood of entering the same industry as the parent by 2.4%.<sup>22</sup> Tests for interaction effects indicate that this effect does not vary by an individual's prior work experience or the self-employment status of their parents.

I turn now to consider how parental self-employment affects the performance. If it is the case that exposure to parental self-employment during adolescence leads to the acquisition of entrepreneurial skills, then we should expect children of the self-employed to perform better once they enter self-employment (Hypothesis 5). I test Hypothesis 5 by looking at two measures of performance: the rate of exit from self-employment, and self-employment income in the first year of self-employment. Both measures are imperfect in certain respects. In the case of exit from self-employment, there are two measurement limitations. First, I am only able to track exit timing for individuals who entered into self-employment as unincorporated or private employers. However, these cases account for 83% of entrants in this sample. Second, exit from private self-employment will not in all cases mean entrepreneurial failure. For example, a successful entrepreneur may incorporate his or her venture. In IDA, this would be recorded as an exit from private self-employment, even though the venture is ongoing.<sup>23</sup> However, an examination of these transitions (not shown) suggests that most represent entrepreneurial failure. For example, 69% of those leaving self-employment enter employment in a different

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<sup>22</sup> Parental wealth is measured in 100,000 Danish kroner units:  $\exp(2.956 \cdot -.012) / \exp(0.906 \cdot -.012) = 0.976$ .

<sup>23</sup> The problem here is that Statistics Denmark does not release, for confidentiality reasons, workplace identification numbers for private employers.

industry; transitions due to a change in incorporation status should rarely involve changes in industry. Only 3.2% transitioned to employment in upper white-collar jobs in the same industry, which is the destination we would expect if founders of a new venture had changed incorporation status.

Exit rates from self-employment are an imperfect measure of performance since people may, if sufficiently committed to the idea of self-employment, persist in self-employment even when the venture is not successful. Moreover, such persistence in the face of poor performance seems particularly likely to occur if people value the autonomy of self-employment highly. I therefore also present estimates of the effects of parental self-employment on self-employment income in the first year of self-employment. I focus on the first year of self-employment income because measures of income in subsequent years are subject to selection processes as people leave self-employment. Moreover, the first year of self-employment is when initial differences in self-employment skills should reveal themselves most clearly. I measure self-employment income as all non-salary income while self-employed. This is not a precise measure of income derived from self-employment, since it may include other sources of income (such as interests and dividends). I therefore control for family assets in the model. Furthermore, since IDA data are only collected once a year, we do not have precise data on the amount of time an individual has been self-employed and potentially generating self-employment income. Many of these individuals therefore have salary incomes in their first year of self-employment; I control for this as well. An alternative approach involves restricting the analysis to those with no salary income. Doing so does not change the substance of the results.

Table 9 contains estimates from piecewise constant hazard rate models of exit from private employer status as a function of parental self-employment. Failure rates decline with an individual's own work experience in the industry prior to entering, and with the presence of parents working in the same industry. This latter effect suggests that people may benefit from their parent's knowledge of the industry. However, the estimates indicate that parental self-employment has no effect on the exit rate. For example, the second model contains a dummy variable for whether an individual's parents were self-employed during the child's adolescence. If one subscribes to the argument that children acquire entrepreneurial skills by observing and working for the parents in the family home, this variable should lower the exit rate. While the coefficient estimate is in the expected direction, it is not significant. Hypothesis 5 is not supported in the analysis of failure rates.

In light of the evidence in Table 8 that the children of the self-employed are much more likely to enter their parent's industry, one might expect that they benefit from having self-employed parents in the same industry. However, there is no evidence for this. The third model suggests that current parental self-employment in general has no significant impact on the failure rate. Furthermore, there is little support for the notion that it is particularly beneficial to have a self-employed parent in the same industry; the improvement in fit between the first and fourth models in Table 9 is not significant.

Table 10 presents OLS regression estimates of the determinants of self-employment income in the first year of self-employment. Again, there is no evidence that having self-employed parents helps performance. Individuals whose parents were self-

employed during their adolescence do not have significantly higher self-employment income. Current parental self-employment does not have an impact either.

In summary, there is no evidence in either Table 9 or 10 that is consistent with Hypothesis 5. However, these tests are limited by the available data, since IDA does not contain information on the extent to which children of the self-employed actually worked in their parent's business. For those who did not, the opportunity to acquire entrepreneurial skills was limited to observation of the self-employed parent. It is difficult to assess the extent to which children's exposure was limited to observing their self-employed parents, but Adlrich, Renzulli and Langton's (1998) evidence suggests parental self-employment during adolescence is associated with work experience in the family firm, but that this experience has no measurable impact on subsequent entrepreneurial performance.

### Discussion

The transmission of self-employment is as a remarkable instance of the influence of family background on career choice. Consistent with evidence from the United States, the Danish data show that having a self-employed parent doubles the raw rate of entry into self-employment. Yet despite the remarkable magnitude of this effect, sociologists have a limited understanding of the social processes behind it. While scholars have advanced a variety of different theories to explain how self-employed parents shape their children's career choices so strongly, the reliance on static comparisons of the statuses of the two generations has made it impossible to adjudicate between the different accounts. By adopting a life course perspective and using unique, longitudinal data, I have

addressed this identification problem and shed greater light on how self-employed parents shape their children's career choices. While this study does not provide a definitive explanation for the transmission of self-employment, the analyses suggest that some suspects can be eliminated from consideration in the Danish case.

First, parental wealth does not explain the transmission of self-employment in Denmark. While continuously self-employed parents had higher average wealth levels than other parents, this difference could not account for the higher rates of self-employment among children of the self-employed. Parental wealth had no direct effect on the rate of self-employment, suggesting that, in the Danish context, differential access to "family credit markets" (Dunn and Holtz-Eakin 2000: 283) does not constitute a barrier to entry to self-employment. This may reflect the relative absence among Danes of the expectation that parental wealth could or should be used in this way. For example, Hancock and Bager (2001) found that despite a generally high reliance on informal sources of funding among entrepreneurs (relative to formal funding channels), only 12% of surveyed nascent entrepreneurs in Denmark expected to turn to family and relatives to fund their new ventures, and only 11% of recently launched ventures had done so. Nonetheless, this evidence echoes studies in the United States (Dunn and Holtz-Eakin 2000) and Canada (Aldrich, Renzulli and Langton 1998) that found weak effects of parental wealth at best, and the results presented here reinforce the conclusion that parental wealth is not a necessary condition for the transmission of self-employment in highly developed, industrialized societies.

Second, while parental self-employment has dramatic effects on rates of entry into self-employment, it has no measurable impact on performance in self-employment. There

is no support for the hypothesis that children of the self-employed have superior self-employment skills. Children of the self-employed do not leave self-employment at a lower rate, and do not generate more self-employment income in their first year of self-employment. A fervent supporter of the skill acquisition argument might argue that this reflects measurement error, as IDA does not contain any direct measure of work experience in the family firm. However, while exposure to parental self-employment during adolescence is not sufficient to increase the returns to self-employment, it is sufficient to generate dramatically higher rates of entry into self-employment. It is difficult to conclude from this that the transmission of self-employment can be attributed to the acquisition of entrepreneurial skills.

The evidence for the social capital hypothesis is more mixed. On the one hand, the transmission of self-employment is not limited to children entering self-employment in the same industry as their parents; parental self-employment has a more general effect on the entry rate. Thus the effect of parental self-employment is not fully mediated by the parent's social capital, as measured here. On the other hand, children of the self-employed are substantially more likely to choose their parent's industry for their entrepreneurial activity than children of the employed. This is consistent with the argument that self-employed parents are in a position to communicate valuable information to their children about entrepreneurial opportunities, and broker contacts with resource holders. However, it is worth noting that the power of the social capital of self-employed parents is limited, as there are no post-entry performance benefits associated with having self-employed parents in the same industry. Roberts (1991) similarly found that while family background exerted a strong influence on rates of entry

into high-technology entrepreneurship, it had no effect on entrepreneurial performance. This makes it difficult to argue that the transmission of self-employment arises from parents passing on privilege to their children, or that the children of the non-self-employed are systematically disadvantaged in the entrepreneurial process. In light of this, one might suspect that the effects on industry choice do not represent transfers of social capital, but rather a more focused form of role modeling, where the children of the self-employed not only value or aspire to self-employment, but also aspire to be in the same industry as their parents. This alternative interpretation cannot be ruled out with the current data, and so the reasons for the effects of parental self-employment on industry choice should be explored in future research.

Finally, parental self-employment during adolescence alone is sufficient to generate substantially higher self-employment rates. Parents thus appear able to shape their children's propensity to enter into self-employment relatively early in life. The magnitude and robustness of this effect is striking, particularly in light of the restrictive and somewhat arbitrary cutoff for defining exposure during adolescence. Furthermore, there is little evidence to suggest that this effect is driven by any positional advantages possessed by these parents, since they are less wealthy than those who remain in self-employment and predominantly remain in the labor force after leaving self-employment. Scholars have long argued that parental role modeling and job values exert a strong influence on the decision to enter self-employment (Hout 1984; Aldrich, Renzulli and Langton 1998) and on children's work values and career choices more generally (Kohn 1969; Miller and Swanson 1958; Johnson 2002). Yet with only a single measure of parental status early in life, the conclusions from earlier research have rested on the

assumption that the influence of parents on their children's aspirations and work values during adolescence have a lasting impact on subsequent career choices, and that adult experiences have a minor impact by comparison (e.g., Halaby 2003: 257) By identifying different parental trajectories of self-employment, I avoid making this assumption and strengthened the empirical foundations of the role modeling argument.

### Conclusion

High levels of occupational inheritance are commonly seen as evidence of barriers to mobility into privileged class positions, as the children of class incumbents benefit from exclusive access to valuable resources. There is little evidence in this study, however, to suggest that the high rates of intergenerational transmission of self-employment are primarily produced by exclusionary processes by self-employed parents to benefit their children. This may be surprising to some, since the "property barrier" has long assumed a central place in sociological thinking about the nature of class boundaries in contemporary society. The results of this study do not rule out the possibility that the property barrier is salient for other types of class reproduction. However, the property barrier is commonly thought to be particularly important in the case of entry into the employer class (e.g., Western and Wright 1994), which is the outcome I have analyzed, and one where we might have most expected to see evidence of such closure processes.

In assessing the implications of this, it is useful to recall that closure processes can explain differential entry rates into positions when access to those positions is regulated and influenced by the incumbents of the position. In advanced capitalist societies, self-employment likely does not constitute a closed position in this sense



(Sørensen 1983). In societies characterized by well-functioning capital markets, dynamic and flexible labor markets and well-developed education and training systems, there are simply relatively few hurdles that prevent people from entering self-employment if they so desire (although substantial hurdles to success). In developing societies, by contrast, where such institutions are less well-developed, the family may play a substantially greater role in easing their children's entry into self-employment or entrepreneurship.

Credentials and licensing play a greater role in regulating access to other positions in social structure, such as the professions, and incumbents of these positions may be able to facilitate their children's access to the institutions that grant the necessary credentials (Sørensen 2000). The focused nature of this study therefore makes it impossible to rule out the possibility that closure processes account for some forms of class reproduction. The extent to which this is the case can only be determined from future research. But we *can* conclude from this study that closure processes cannot provide a *general* explanation for class reproduction. Indeed, it is possible that the mechanisms underlying occupational inheritance may vary across occupations, depending on the strength and nature of occupational structuration (Grusky and Sørensen 1998). It is also possible that in advanced capitalist societies, many of the theoretical mechanisms identified by sociologists as structural sources of inequality – such as credentials – may be more germane to career dynamics and labor market outcomes (Sørensen 2000; Weeden 2002). Closure accounts may stand on firmer ground in trying to account for rigidities in intra-generational outcomes than when trying to account for the intergenerational transmission of status.

For students of entrepreneurial processes, perhaps the most striking result in these analyses is the striking effect of exposure to parental self-employment during adolescence alone. Coupled with the fact that there is little evidence to support the notion that children of the self-employed have superior entrepreneurial skills, this result suggests that the family environment has a dramatic impact on the likelihood of subsequent entrepreneurial activity. While policies directed at encouraging entrepreneurial activity may focus by necessity on factors that inhibit access to entrepreneurial opportunities, this suggests that there is an important supply-side component to the dynamics of entrepreneurship. What remains unclear is the nature the role modeling process and its impact on the transmission of self-employment. At least three different mechanisms can be identified. First, as has been argued in the literature, higher self-employment rates among children of self-employed may reflect a greater preference for autonomy in their work lives relative to other children (Hout 1984). Second, exposure to parental self-employment may raise children's subsequent risk tolerance, or their willingness to accept greater uncertainty about their income in exchange for higher expected returns (Halaby 2003; Miller and Swanson 1958). Both of these mechanisms suggest that parental influence operates through its effects on how children value different career options. Finally, parents' location in social structure may shape children's cognitive maps of the landscape of occupational opportunities (Carroll and Mosakowski 1987). From this perspective, children never exposed to self-employment may not actually attach less value to self-employment, but simply be less likely to consider it as an option. Adjudicating between these accounts is an important issue for future research.

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Table 1: Observed trajectories of parental self-employment

Child's adolescence	Parent Self-employed?	Child's adulthood	
		Yes	No
	Yes	48,595 21.3%	6,662 2.9%
	No	22,692 9.9%	150,423 65.9%

Table 2: Self-employment as a percentage of all non-agricultural employment in OECD countries, 1986 and 1996

	1986	1996
Australia	11.8	11.3
Austria	7.4 <sup>a</sup>	7.4
Belgium	13.8	14.4 <sup>b</sup>
Canada	6.9	8.9
Denmark	7.7	7.2
Finland	6.6	9.1
France	9.5	7.8
Germany	7.7	8.3
Greece	24.6	25.1 <sup>c</sup>
Iceland	8.6	13.2
Ireland	10.4	11.7
Italy	20.5	20.8
Japan	15.8	12.0
Luxembourg	7.6	5.4 <sup>c</sup>
Netherlands	7.6	9.6
New Zealand	12.1	14.5
Norway	7.1	5.4
Portugal	14.5	17.3
Spain	18.4	17.4
Sweden	4.1	8.5
Turkey	21.9 <sup>d</sup>	22.8
UK	9.6	11.3
USA	7.1	6.8

a=1994; b=1992; c=1995; d=1988

Source: Blanchflower (2000)



Table 3: Parental self-employment during child's adolescence and highest educational level achieved (N=228,372)

<i>Parental self-employment</i>		Compulsory	Vocational	Academic	University
			Upper Secondary	Upper Secondary	
<i>Men</i>					
Never	N	23,327	41,365	6,633	17,175
	Row %	26.4	46.7	7.5	19.4
Ever	N	6,352	14,362	1,912	5,802
	Row %	22.3	50.5	6.7	20.4
<i>Women</i>					
Never	N	20,742	35,569	7,715	20,589
	Row %	24.5	42.0	9.1	24.33
Ever	N	4,656	11,985	2,517	7,671
	Row %	17.4	44.7	9.4	28.6

Table 4: Logistic regression estimates of the rate of first entry into non-agricultural self-employment

Variable	(1)	(2)	(3)	(4)
Age 16-17	-11.503** (1.558)	-11.449** (1.558)	-11.489** (1.559)	-11.518** (1.559)
Age 18-19	-10.197** (1.634)	-10.150** (1.634)	-10.198** (1.635)	-10.236** (1.636)
Age 20-21	-10.310** (1.685)	-10.265** (1.685)	-10.298** (1.686)	-10.335** (1.686)
Age 22-23	-10.510** (1.706)	-10.468** (1.706)	-10.488** (1.708)	-10.525** (1.708)
Age 24-25	-10.479** (1.751)	-10.438** (1.751)	-10.458** (1.752)	-10.495** (1.752)
Age 26-27	-10.733** (1.808)	-10.692** (1.808)	-10.709** (1.809)	-10.746** (1.809)
Age 28-29	-11.028** (1.863)	-10.988** (1.863)	-10.998** (1.864)	-11.036** (1.864)
Age 30-31	-11.213** (1.919)	-11.172** (1.919)	-11.175** (1.921)	-11.212** (1.921)
GNP	-0.502** (0.058)	-0.501** (0.058)	-0.507** (0.058)	-0.507** (0.058)
GNP Growth	0.020 (0.019)	0.021 (0.019)	-0.004 (0.019)	-0.007 (0.019)
Average Sentiment: Economy Now	0.051 (0.044)	0.044 (0.044)	0.058 (0.044)	0.050 (0.044)
Average Sentiment: Economy Next Year	0.014 (0.071)	0.012 (0.071)	0.017 (0.071)	0.012 (0.071)
Female	0.005 (0.095)	0.004 (0.095)	0.011 (0.095)	0.010 (0.095)
N Siblings	0.107 (0.159)	0.107 (0.159)	0.098 (0.159)	0.099 (0.159)
First born child	0.160** (0.047)	0.160** (0.047)	0.169** (0.047)	0.171** (0.047)
Female * First born	1.286** (0.210)	1.277** (0.210)	1.245** (0.210)	1.232** (0.210)
Married	-0.227* (0.091)	-0.225* (0.091)	-0.225* (0.091)	-0.222* (0.091)
Female * Married	0.008 (0.137)	0.009 (0.137)	0.011 (0.137)	0.015 (0.137)
N Children	-0.399** (0.058)	-0.401** (0.058)	-0.402** (0.058)	-0.404** (0.058)
Female * N Children	0.477** (0.047)	0.480** (0.047)	0.462** (0.047)	0.466** (0.047)
Spouse Self-Employed	0.342** (0.070)	0.338** (0.070)	0.331** (0.070)	0.328** (0.070)
Female * Spouse Self-Employed	0.829** (0.064)	0.830** (0.064)	0.797** (0.064)	0.797** (0.064)
Spouse Employed	-0.362**	-0.362**	-0.351**	-0.347**

	(0.065)	(0.065)	(0.065)	(0.065)
Female * Spouse Employed	-0.265**	-0.261**	-0.271**	-0.267**
	(0.061)	(0.061)	(0.061)	(0.061)
Spouse Unemployed	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Female * Spouse Unemployed	0.011	0.011	0.011	0.011
	(0.008)	(0.008)	(0.008)	(0.008)
In School	0.002**	0.002**	0.002**	0.002**
	(0.000)	(0.000)	(0.000)	(0.000)
Highest education: Vocational	0.086**	0.086**	0.085**	0.083**
	(0.011)	(0.011)	(0.011)	(0.011)
Highest education: Academic	0.050**	0.050**	0.049**	0.049**
	(0.008)	(0.008)	(0.008)	(0.008)
Highest education: University	-0.061**	-0.061**	-0.060**	-0.060**
	(0.010)	(0.010)	(0.010)	(0.010)
White collar	-0.237**	-0.238**	-0.233**	-0.235**
	(0.072)	(0.072)	(0.071)	(0.071)
Blue collar	-0.362*	-0.360*	-0.366*	-0.364*
	(0.161)	(0.161)	(0.161)	(0.161)
Degree of Unemployment	-0.347	-0.335	-0.366	-0.356
	(0.269)	(0.269)	(0.269)	(0.269)
Log Salary	0.356	0.355	0.360	0.354
	(0.263)	(0.263)	(0.263)	(0.263)
Non-salary income	0.317	0.306	0.318	0.315
	(0.369)	(0.369)	(0.369)	(0.369)
Wage experience	4.622*	4.672*	4.414*	4.414*
	(1.987)	(1.987)	(1.986)	(1.986)
Industry experience	-0.027**	-0.027**	-0.027**	-0.027**
	(0.007)	(0.007)	(0.007)	(0.007)
Firm tenure	0.036**	0.036**	0.036**	0.036**
	(0.012)	(0.012)	(0.012)	(0.012)
No Parents	0.460**	0.476**	0.499**	0.508**
	(0.141)	(0.140)	(0.140)	(0.141)
Log Family Assets	0.117**	0.117**	0.104**	0.103**
	(0.009)	(0.009)	(0.009)	(0.008)
Log Family Debts	0.062**	0.061**	0.067**	0.066**
	(0.006)	(0.006)	(0.006)	(0.006)
<i>Parental self-employment during child's:</i>				
Adolescence only	0.197*			0.422**
	(0.088)			(0.089)
Adulthood only		0.320**		0.517**
		(0.054)		(0.056)
Adolescence & Adulthood			0.523**	0.612**
			(0.036)	(0.038)
Log-likelihood	-25,971	-25,941	-25,934	-25,930

Two-sided t-tests: \* p<.05 \*\* p<.01

Table 5: Destinations of Parents Who Left Self-Employment Before Child's Adulthood

	Same Industry	Different Industry	Total
Upper white collar	216 <i>2.9%</i>	511 <i>7.0%</i>	727 <i>9.9%</i>
Lower white collar	305 <i>4.2%</i>	1,392 <i>18.9%</i>	1,697 <i>23.1%</i>
Skilled blue collar	131 <i>1.8%</i>	434 <i>5.9%</i>	565 <i>7.7%</i>
Unskilled blue collar	131 <i>1.8%</i>	1,290 <i>17.6%</i>	1,421 <i>19.3%</i>
Employed n.e.c.	101 <i>1.4%</i>	355 <i>4.8%</i>	456 <i>6.2%</i>
Unemployed			1,201 <i>16.3%</i>
NILF			947 <i>12.9%</i>
Retired			332 <i>4.5%</i>
	884 <i>12.0%</i>	3,982 <i>88.0%</i>	7,346 <i>100%</i>

Note: Percentage figures are percent of total parental transitions from self-employment (7,346). Number of parental transitions is higher than 6,662 in Table 1 due to double-counting of mothers and fathers who both left self-employment.

Table 6: Effects of Parental Wealth

Variable	(1)	(2)	(3)	(4)	(5)
Parental wealth	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.003* (0.001)	0.003* (0.001)
<i>Parental self-employment during child's:</i>					
Adolescence only	0.421** (0.089)	0.446** (0.091)	0.422** (0.089)	0.417** (0.090)	0.449** (0.091)
Adulthood only	0.516** (0.056)	0.516** (0.056)	0.502** (0.056)	0.515** (0.056)	0.507** (0.056)
Adolescence & Adulthood	0.611** (0.038)	0.610** (0.038)	0.612** (0.038)	0.618** (0.038)	0.619** (0.038)
Adolescence * Parental Wealth		-0.012 (0.013)			-0.014 (0.013)
Adulthood * Parental Wealth			0.005* (0.002)		0.002 (0.002)
Adolescence & Adulthood * Parental Wealth				-0.003 (0.002)	-0.003 (0.002)
Log-likelihood	-25,929	-25,928	-25,927	-25,928	-25,925

Note: All models include the full set of covariates included in Table 4.

Two-sided t-tests: \* p<.05 \*\* p<.01

Table 7 Models of industry choice

A) Competing risk logistic regression estimates of rate of first entry into self-employment into same or different industry as parent(s)

	(1)		(2)	
	Same Industry	Different Industry	Same Industry	Different Industry
Parental wealth	-0.003*	0.002**	-0.003*	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Employed in same industry as parent	2.140**	-0.327**	2.327**	-0.418**
	(0.133)	(0.059)	(0.167)	(0.064)
Parent currently self-employed	0.971**	0.428**	1.350**	0.255**
	(0.078)	(0.044)	(0.211)	(0.064)
Employed in same industry * Parent currently self-employed			-0.435	0.331**
			(0.224)	(0.086)
Log-likelihood	-6,126	-21,374	-6,124	-21,367

Note: All models contain the full set of covariates included in Table 3. Estimated standard errors are adjusted for the covariance of the estimators across the equations for the competing risks (Weesie 1999).

Two-sided t-tests: \* p<.05 \*\* p<.01

B) Logistic regression models of choosing the same industry as parent(s), conditional on entry into self-employment

	(1)	(2)
Parental wealth	-0.012*	-0.012*
	(0.006)	(0.006)
Employed in same industry as parent	1.798**	2.035**
	(0.111)	(0.149)
Parent currently self-employed	0.538**	1.045**
	(0.087)	(0.206)
Employed in same industry * Parent currently self-employed		-0.615**
		(0.227)
Log-likelihood	-1,815	-1,812

Note: N=3,934

Two-sided t-tests: \* p<.05 \*\* p<.01

Table 8: Net Effects on Industry Choice

		Parent Currently Self-employed	
		Yes	No
Employed in Same Industry as Parent	Yes	2.465	2.035
	No	1.420	0

Note: Net effects from Model 2 in Table 5, Panel B.

Table 9: Piecewise-constant hazard rate models of exit from status as private employer

Variable	(1)	(2)	(3)	(4)
0-5 Years in Self-employment	0.641 (0.502)	0.683 (0.504)	0.660 (0.504)	0.649 (0.504)
5 + Years in Self-employment	-0.114 (0.514)	-0.072 (0.516)	-0.095 (0.517)	-0.102 (0.516)
Female	-0.099 (0.091)	-0.100 (0.091)	-0.099 (0.091)	-0.098 (0.091)
Married	-0.208 (0.121)	-0.208 (0.121)	-0.208 (0.121)	-0.208 (0.121)
Female * Married	0.298* (0.144)	0.297* (0.144)	0.298* (0.144)	0.297* (0.144)
N Children	0.089 (0.063)	0.089 (0.063)	0.089 (0.063)	0.089 (0.063)
Highest education: Vocational	-0.268** (0.082)	-0.269** (0.082)	-0.268** (0.082)	-0.266** (0.082)
Highest education: Academic	-0.104 (0.131)	-0.106 (0.131)	-0.105 (0.131)	-0.102 (0.131)
Highest education: University	-0.338* (0.165)	-0.336* (0.166)	-0.336* (0.166)	-0.340* (0.166)
Prior Occupation: White Collar	-0.082 (0.122)	-0.084 (0.122)	-0.082 (0.122)	-0.079 (0.122)
Prior Occupation: Blue Collar	-0.217 (0.114)	-0.218 (0.114)	-0.219 (0.114)	-0.220 (0.114)
Prior Degree of Unemployment	4.604 (19.677)	4.141 (19.676)	4.446 (19.683)	3.082 (19.721)
Prior Log Income	-0.011 (0.016)	-0.011 (0.016)	-0.010 (0.016)	-0.011 (0.016)
Prior Non-Salary Income	0.000 (0.002)	0.000 (0.002)	0.000 (0.002)	0.000 (0.002)
Wage Experience	-0.041 (0.022)	-0.041 (0.022)	-0.041 (0.022)	-0.042 (0.022)
Age	-0.069** (0.025)	-0.070** (0.025)	-0.070** (0.025)	-0.068** (0.025)
Self-employment Income	-0.331** (0.044)	-0.331** (0.044)	-0.331** (0.044)	-0.330** (0.044)
Log Salary During Self-Employment	0.060** (0.007)	0.060** (0.007)	0.060** (0.007)	0.060** (0.007)
Log Family Assets	-0.036** (0.012)	-0.035** (0.012)	-0.036** (0.012)	-0.036** (0.012)
Log Family Debts	0.038** (0.011)	0.038** (0.011)	0.038** (0.011)	0.037** (0.011)
Experience in Industry Entered	-0.078** (0.016)	-0.079** (0.016)	-0.078** (0.016)	-0.081** (0.016)
Parent(s) are in Same Industry	-0.496** (0.096)	-0.488** (0.097)	-0.491** (0.097)	-0.613** (0.132)



Parent(s) self-employed during adolescence	-0.065 (0.069)			
Parent(s) currently self-employed		-0.027 (0.074)	-0.077 (0.082)	
Parent(s) currently self-employed*			0.283 (0.195)	
Parent(s) are in Same Industry				
Log-likelihood	-2,064	-2,064	-2,064	-2,063

Note: N=7,168 spells and 937 failures.

Two-sided t-tests: \* p<.05 \*\* p<.01

Table 10: OLS Regression Estimates of Determinants of Self-employment Income in First Year of Self-employment

Variable	(1)	(2)	(3)	(4)
Female	-8.178** (3.171)	-8.087* (3.171)	-8.115* (3.172)	-8.039* (3.172)
Married	-0.093 (3.866)	0.096 (3.867)	0.009 (3.867)	0.064 (3.866)
Female * Married	-2.797 (4.918)	-2.924 (4.918)	-2.949 (4.920)	-2.984 (4.919)
N Children	2.823 (2.148)	2.865 (2.148)	2.915 (2.150)	2.953 (2.149)
Highest education: Vocational	2.738 (2.889)	2.750 (2.888)	2.752 (2.889)	2.856 (2.889)
Highest education: Academic	3.356 (5.072)	3.483 (5.071)	3.317 (5.071)	3.420 (5.071)
Highest education: University	4.459 (5.167)	4.292 (5.167)	4.241 (5.170)	4.226 (5.169)
Prior Occupation: White Collar	12.584** (4.375)	12.488** (4.374)	12.690** (4.375)	12.867** (4.376)
Prior Occupation: Blue Collar	13.303** (4.046)	13.048** (4.048)	13.380** (4.046)	13.453** (4.046)
Prior Degree of Unemployment	410.988 (643.912)	430.718 (643.851)	430.566 (644.110)	408.169 (644.207)
Prior Log Income	1.707** (0.540)	1.713** (0.539)	1.692** (0.540)	1.671** (0.540)
Prior Non-Salary Income	0.275** (0.045)	0.274** (0.045)	0.274** (0.045)	0.274** (0.045)
Wage Experience	1.745* (0.729)	1.756* (0.728)	1.734* (0.729)	1.720* (0.728)
Age	-1.120 (0.826)	-1.073 (0.826)	-1.039 (0.829)	-0.986 (0.830)
Log Salary During Self-Employment	-5.778** (0.264)	-5.757** (0.265)	-5.773** (0.264)	-5.766** (0.264)
Log Family Assets	1.459** (0.471)	1.392** (0.473)	1.410** (0.473)	1.398** (0.473)
Log Family Debts	-0.420 (0.364)	-0.397 (0.365)	-0.408 (0.365)	-0.414 (0.365)
Experience in Industry Entered	1.825** (0.497)	1.848** (0.497)	1.834** (0.497)	1.821** (0.497)
Parent(s) are in Same Industry	4.445 (3.059)	3.843 (3.081)	3.857 (3.102)	1.115 (3.688)
Parent(s) self-employed during adolescence		3.664 (2.324)		
Parent(s) currently self-employed			2.858	0.659

Parent(s) currently self-employed*			(2.526)	(2.990)
Parent(s) are in Same Industry				7.453
				(5.424)
R <sup>2</sup>	0.207	0.208	0.208	0.208
N	2,634	2,634	2,634	2,634

Two-sided t-tests: \* p<.05 \*\* p<.01

Figure 1: Potential combinations of parental self-employment during different life stages of the child

Child's adolescence	Parent Self-employed?	Child's adulthood	
		Yes	No
	Yes	<i>A</i>	<i>B</i>
	No	<i>C</i>	<i>D</i>

Figure 2



Figure 3

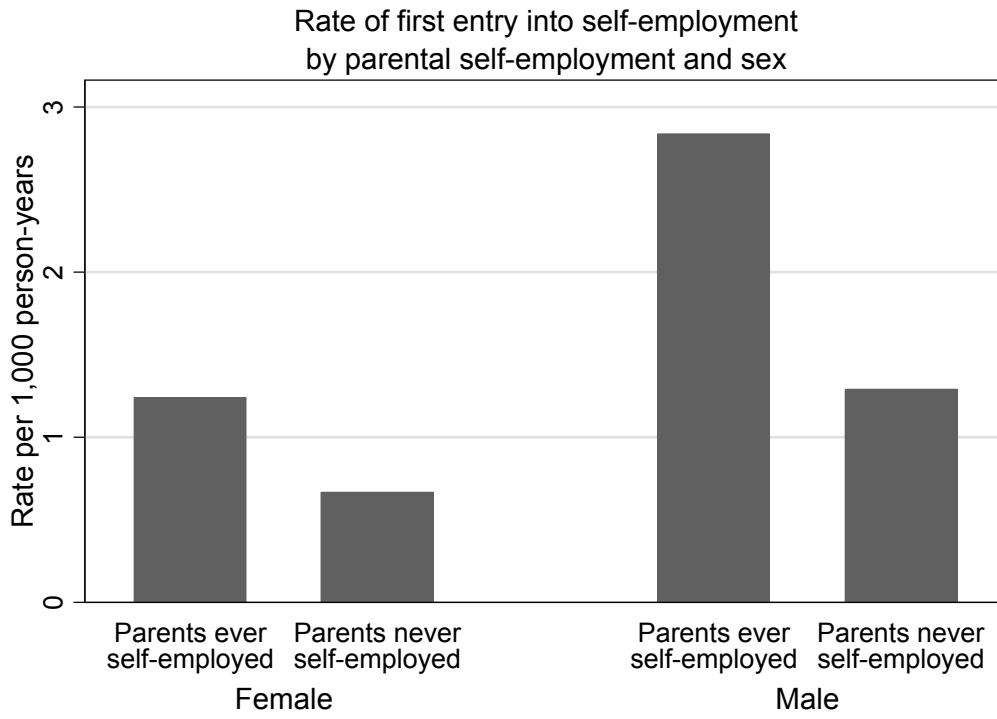


Figure 4

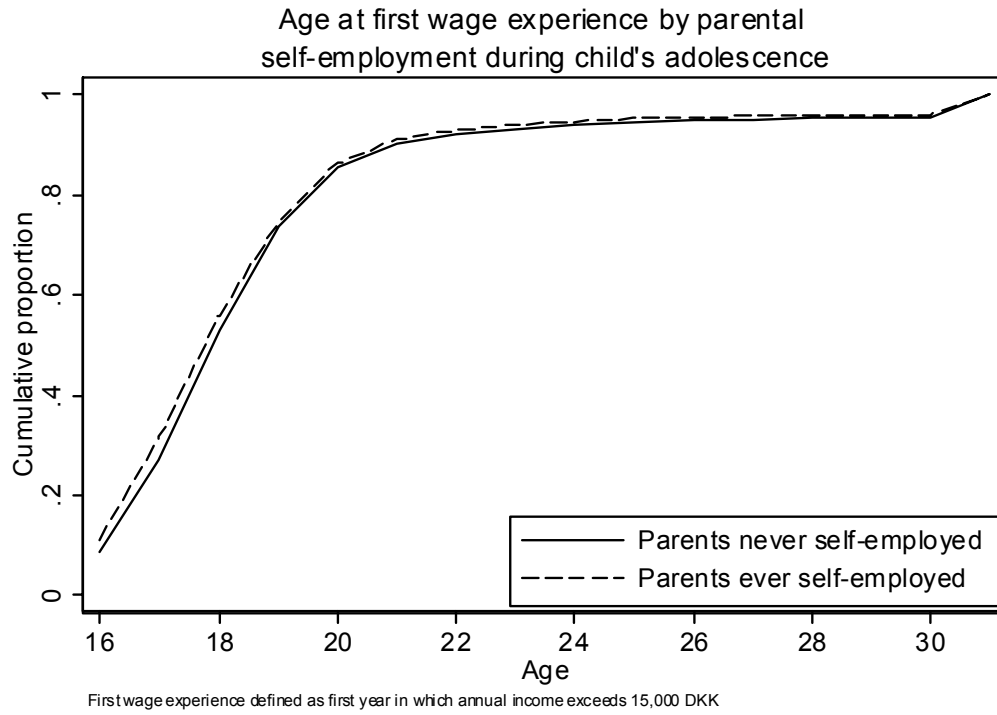


Figure 5





Figure 6

