Getting a Helping Hand: Parental Transfers and First-Time Homebuyers

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Abstract

A model that allows for inter vivos intergenerational transfers in a booming housing market is developed. The model is used to explain how transfers effect the first-time homebuyer's consumption and housing decisions by alleviating borrowing constraints. The general implications of the model are tested using data from the leading Irish mortgage provider. We find that private transfers are targeted towards homebuyers that are liquidity constrained.

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1. Introduction

Getting on to the property ladder is an onerous task for first-time homebuyers, particularly in a housing boom. Purchasing a house is one of the main financial decisions made by consumers and is usually financed by large borrowings over a long period. However borrowing to purchase a dwelling may be constrained as the household may not be able to access one-hundred per cent of the purchase price. This imposes a need to save for a downpayment, a requirement that becomes more difficult to meet when house prices rise rapidly (see for example Engelhardt and Mayer [11], [12]). For some, the downpayment constraint may be alleviated by receipt of a transfer from parents, relatives and/or friends. The transfer can be in the form of a gift, a loan or some combination of the two. Much of the existing literature on transfers in the housing market has an empirical focus. In this paper we develop a two-life segments model comprised of a two-person family; a parent and child. After getting a helping hand from the parent the child purchases a house in the first segment of life and sells the house in the second segment ending with a target level of wealth they can use in future life segments, say to move up the property ladder. The model allows analysis of key factors that influence the transfer decision of the parent and the impact of transfers on the child's housing consumption under a variety of scenarios. These scenarios include whether the transfer is a gift or a loan and/or whether the child is liquidity-constrained. The model nests the two-life segments housing model of Schwab [22] and the two-life segments inter vivos intergenerational transfer model of Cox and Japelli [5] as special cases.

This paper also empirically investigates the role of parental transfers[1] as a development in the Irish housing market that has received much media attention due to the current house price boom[2]. While rapid real price increases may have moved home purchase outside the ability of many first-time buyer's on their own, some parents are using the equity in their home to secure a loan, which they transfer to their child and other parents are giving gifts of land. This enables the first-time buyer to access to the property market.

A first reaction may be that such a transfer increases the utility of a first-time buyer as it allows access to the housing market. Indeed this may well be the case if the transfer is a gift that does not have

to be repaid. Engelhardt and Mayer [12] and Guiso and Jappelli [16] empirically show that receipt of a gift increases the value of the house purchased. They also find that the first-time buyer adjusts along other margins; they have a lower loan-to-value ratio, they reduce savings and/or purchase a dwelling sooner than expected. A private gift may also mean that any reduction in consumption of other consumer goods[3] to get on the housing ladder may not be as great as the case where there is no transfer (see Engelhardt and Mayer [12]).

The situation becomes more complex if the parental transfer is a loan to be repaid. While the first-time buyer may initially enjoy higher utility due to the purchase of a home, the need to make loan repayments to both the mortgage provider and the parent introduces the a tighter future budget constraint. In this case a transfer may lead to a reduction in the demand for of housing. The impact of the transfer may well depend on how the overall housing market is performing at the time of the transfer. If the housing market is booming and real prices are rising rapidly the first-time buyer may use the transfer to get on to the property ladder sooner than anticipated, allowing the first-time buyer to benefit from capital gains. If the property market is stable or prices are falling the first-time buyer may use the transfer to buy a bigger property or may wait and combine the transfer with their own savings to provide themselves with more options once they decide to enter the market.

The theoretical section develops a model within which the impact of parental transfers can be examined and finds that house price inflation can play an important role for recipients who are liquidity constrained. This is particularly the case when house price inflation is high, as it has been in Ireland in recent years. In common with the international literature the empirical section finds that receipt of a transfer increases the value of the house purchased and the downpayment, and reduces saving.

Section 2 provides an overview of some of the existing literature. A general theoretical model in which the role of parental transfers on the child's consumption and housing expenditure can be considered is presented in Section 3. An example is provided in Section 4. Section 5 provides some empirical analysis using data from a survey of first-time housebuyers. Section 6 concludes.

2. Relevant Literature

The affordability of housing is a topic that has generated much interest and research. From a housing perspective an associated area of research has been the use of private transfers to overcome credit constraints. Cox [3] models the utility of parents making a private transfer to a child. One of the motivations behind transfers is the existence of utility interdependence between consumers. He finds that private transfers are targeted towards liquidity-constrained consumers and a transfer from a parent will take place "if optimal child-consumption exceeds his current income." Furthermore, intergenerational transfers act in part as loans or subsidies that are used to help overcome liquidity constraints, with the transfers likely "to increase consumption flows and reduce capital formation." In this model the child provides services to parents that gives utility to the parent and disutility to the child. There is an incentive compatibility constraint where the utility of the child who accepts transfers and provides services is never lower than utility if they did not enter this relationship with their parents. The approach of Cox [3] is continued in Cox and Jappelli [5] who make first-period transfers an intergenerational loan that is repaid by the child in the second period (a negative transfer). There are many papers that focus on parental transfers and what determines receipt of a transfer, the timing of such transfers and whether or not they are targeted at liquidity constrained households (Cox [3], Cox [4], Cox and Rank [6], Guiso and Jappelli [15]). In a more recent article Cox and Stark [7] examine the relationship between tied transfers aimed at housing downpayment and find that such transfers are partly driven by the transfer recipients fertility plans.

There has also been much work in the empirical literature. Mayer and Engelhardt [18], using recent homebuyers in eighteen major US cities, find that the transfer receipt as part of a downpayment for housing is related to financial constraints. Engelhardt and Mayer [11], using the same dataset, examine the impact of transfers on repeat and first-time buyers and find results consistent with the view that "the most important role for gifts is to loosen the downpayment constraint for first-time buyers." Engelhardt [10], using Canadian data, finds that the decision to save for house purchase is affected by the interaction

between house prices and the downpayment obligation as when faced with a downpayment constraint, increasing house prices discourages saving for a downpayment. Mayer and Engelhardt [12], using American data, examine the impact of transfers on housing affordability and find that "first-time home buyers are relying more on gifts from relatives and less on their own savings in accumulating the down payment" allowing them to purchase earlier and to buy more expensive houses than they otherwise would have done. Guiso and Jappelli [16], using Italian data, find "that the main effect of transfers is to increase the value of the house, not to shorten saving time".

3. Theoretical framework

We consider a two life segments model comprised of a two-person family, a parent and a child. The parent (p) is assumed to care about the well being of the child (k). More formally, the parent's utility depends, among other things, on the child's utility. The child is assumed to buy a stock of H units of housing in period 1 and live in it for two periods (or two life segments). We assume that the stock of housing does not depreciate and that the flow of housing services is a constant proportion of the stock.[4] In period i the child receives income $Y_{k,i}$ and derives utility, V_i, from a non-durable composite consumption good $C_{k,i}$ and the flow of housing services. If the child has initial assets, they are included in $Y_{k,1}$. In period i the parent receives income $Y_{p,i}$ and derives utility, U_i, from a non-durable composite consumption good $C_{p,i}$ and the child's utility V_i. The initial house purchase is at the beginning of period 1. Income received, transfers and consumption expenditure occur at the beginning of each period and housing mortgage repayments occur at the end of the period. The parent's and child's discounted utility functions are

$$U = U_1(C_{p,1}, V_1(C_{k,1}, H)) + \beta U_2(C_{p,2}, V_2(C_{k,2}, H)) \quad (1)$$

and

$$V = V_1(C_{k,1}, H) + \beta V_2(C_{k,2}, H) \quad (2)$$

respectively. The subjective discount factor β is assumed to be the same for both individuals. The utility functions U and V are increasing and concave in their arguments and satisfy the following conditions

$$\begin{aligned} &\lim_{C\to 0} U'(C) = \infty \qquad \lim_{C\to \infty} U'(C) = 0 \\ &\lim_{C\to 0} V'(C) = \infty \qquad \lim_{C\to \infty} V'(C) = 0 \end{aligned} \tag{3}$$

The parent has full access to capital markets and his (or her) lifetime budget constraint is given by

$$Y_{p,1} + \frac{Y_{p,2}}{1+r} - T_1 - \frac{T_2}{1+r} - C_{p,1} - \frac{C_{p,2}}{1+r} = 0 \tag{4}$$

where T_i is the amount of the transfer from parent to child in period i and r is the net real interest rate which is assumed to be positive and equal to the mortgage rate. Since inflation is assumed to be zero, r is also the nominal interest rate. We implicitly assume that the parent is dominant in the sense of optimally choosing the amount of the transfer in period 1 while caring about the child's utility. The transfer we have in mind is intergenerational, made in period 1 ($T_1 > 0$), and possibly repaid in period 2 ($T_2 \le 0$).[5] This gives the following constraint

$$T_1 + \frac{T_2}{1+r} \ge 0 \tag{5}$$

Throughout the paper we assume that $T_1 > 0$ and $T_2 = -\omega(1+r)T_1$ where $0 \le \omega \le 1$. This allows us to consider the following cases. If $\omega = 1$ then $T_2 = -(1+r)T_1$, (5) binds and the parent is making a private loan to the child. If $0 < \omega < 1$ then (5) does not bind and the parent is giving the child a subsidy. In this case the loan is only partly repaid. If $\omega = 0$ then $T_2 = 0$ and (5) does not bind and the parent is giving the child a gift. The child's intertemporal budget constraint is

$$\begin{aligned} &Y_{k,1} + \frac{Y_{k,2}}{(1+r)} + T_1 + \frac{T_2}{(1+r)} - C_{k,1} - \frac{C_{k,2}}{(1+r)} - R_3 PH = \frac{W}{(1+r)^2} \\ &\text{where} \quad 1 \ge R_3 = \left(1 - \frac{(1+\pi)^2}{(1+r)^2}\right) \ge -\infty \end{aligned} \tag{6}$$

where π is the constant change in the real house price per period, P is the price of a house in terms of the composite consumption good and W is exogenously determined wealth at the end of period 2. One can think of W as a fixed target the child has after the initial step on the housing ladder. Note R_3 is positive if $r > \pi$. The expression for R_3 requires some explanation.

We assume that the child has some access to the capital markets and can borrow a fraction α of the real purchase price of the house.[6] Given that the transfer in period 1 is a loan, the child treats his (or her) parent as a top up mortgage provider.[7] Interest on the mortgage, $r(\alpha PH)$, is paid at the end of period 1. One can think of this as an interest only loan where the principal is paid off when the borrower sells the house. The child's resource constraint in period 1 is given by

$$\begin{gathered} Y_{k,1} + T_1 - C_{k,1} - (1-\alpha)PH - \frac{r}{1+r}(\alpha PH) \geq 0 \\ Y_{k,1} + T_1 - C_{k,1} - R_1 PH \geq 0 \end{gathered} \tag{7}$$

$$\text{where} \qquad 1 \geq R_1 = \frac{(1-\alpha)(1+r)+\alpha r}{(1+r)} \geq \frac{r}{(1+r)}$$

The term $(1-\alpha)PH$ in (7) is the purchase price of H units of housing minus the amount of the mortgage borrowed by the child from a financial institution at the beginning of period 1, i.e. it is the real downpayment on a house.

Interest and principal, $(1+r)(\alpha PH)$, is paid at the end of period 2. The house is sold for $(1+\pi)^2 PH$ at the end of period 2. If (7) is an equality the child's resource constraint in period 2 is given by

$$Y_{k,2} + T_2 - C_{k,2} - \left(\frac{\left((1+r)\alpha - (1+\pi)^2 \right)}{(1+r)} \right) PH = \frac{W}{1+r}$$

$$Y_{k,2} + T_2 - C_{k,2} - R_2 PH = \frac{W}{1+r} \tag{8}$$

where $\alpha \geq R_2 = \left(\frac{\left((1+r)\alpha - (1+\pi)^2 \right)}{(1+r)} \right) \geq -\infty$

One can think of R_1 and R_2 as net real expenditure on housing in periods 1 and 2. Note $R_2 < 0$ if $(1+r)\alpha < (1+\pi)^2$ or if the proceeds from the sale of the house at the end of period 2 is greater than the repayment of the mortgage interest and principal in period 2. Even if there is no change in real house prices, $R_2 < 0$ if $\alpha < 1/(1+r)$ which would be true in many countries. Of course there is nothing to stop real house prices from falling. In this case it is more than likely that $R_2 > 0$.

The term on PH in (6) is $R_3 = R_1 + R_2/(1+r)$. The discounted mortgage repayment is exactly equal to the initial mortgage and therefore α does not appear in the intertemporal budget constraint. When $H = 0$ and $\alpha = 0$ the model is the same as Cox and Japelli [5] where the child receives parental transfers but does not have any access to the capital markets. When $T_1 = 0$, $T_2 = 0$ and $\alpha = 1$ the model for the child is a variant of Schwab [22].

Housing generally commands a high price relative to income. If the child has accumulated a sufficient stock of assets then he/she can purchase a house without resorting to borrowing and $\alpha = 0$. However, first time buyers usually do not have a sufficient stock of assets and so borrow to make up the shortfall. Potential homebuyers are faced with two issues: how much can they borrow, a borrowing constraint, and how much can they afford to repay, a budget constraint. In the absence of a borrowing constraint the consumer could borrow any amount provided they stay within their intertemporal budget constraint. Typically the maximum permitted mortgage is less than 100 per cent of the dwelling value.

Thus, depending on the interaction of the dwelling price, this borrowing limit and their accumulated assets, the first-time buyer may well face a binding borrowing constraint. In what follows below we consider two cases; where the borrowing constraints are ineffective and where they are effective.

3.1 The child's optimisation problem

The child's problem is to choose $C_{k,i}$ and H, taking $Y_{k,i}$ and T_1 as exogenously given, to maximize

$$\begin{aligned} L_k &= V_1(C_{k,1}, H) + \beta V_2(C_{k,2}, H) \\ &+\lambda_1\left[Y_{k,1} + \frac{Y_{k,2}}{(1+r)} + (1-\omega)T_1 - C_{k,1} - \frac{C_{k,2}}{(1+r)} - R_3 PH - \frac{W}{(1+r)^2} \right] \\ &+\lambda_2\left[Y_{k,1} + T_1 - C_{k,1} - R_1 PH \right] \end{aligned} \tag{9}$$

where λ_1 is the multiplier on the intertemporal budget constraint (6) and λ_2 is the multiplier on the borrowing constraint (7). The first order conditions are

$$\frac{\partial V_1}{\partial C_{k,1}} - \lambda_1 - \lambda_2 = 0 \tag{10}$$

$$\beta \frac{\partial V_2}{\partial C_{k,2}} - \frac{\lambda_1}{1+r} = 0 \tag{11}$$

$$\frac{\partial V_1}{\partial H} + \beta \frac{\partial V_2}{\partial H} - \lambda_1 R_3 P - \lambda_2 R_1 P = 0 \tag{12}$$

(6), (7) and the following Khun-Tucker conditions

$$\lambda_1 \frac{\partial L}{\partial \lambda_1} = 0 \tag{13}$$

$$\lambda_2 \frac{\partial L}{\partial \lambda_2} = 0 \tag{14}$$

We consider two cases. When $\lambda_1 \neq 0$ and $\lambda_2 = 0$ equation (7) is not binding, the child's problem is as if he or she had access to a perfect capital market and (6) holds. When $\lambda_1 \neq 0$ and $\lambda_2 \neq 0$ equation (7) is binding and the borrowing constraint become effective. In both cases one can solve for child's

consumption periods 1 and 2 and housing as functions of their discounted lifetime income, the transfer in period 1 and final period wealth.

3.2 The parent's optimisation problem

The parent's problem is to choose $C_{p,i}$ and T_1, taking the child's optimal decision rules for $C_{k,i}$ and H as exogenously given, to maximize

$$\begin{aligned} U = {} & U_1(C_{p,1}, V_1(C_{k,1}, H)) + \beta U_2(C_{p,2}, V_2(C_{k,2}, H)) \\ & + \lambda_p \left[Y_{p,1} + \frac{Y_{p,2}}{1+r} - (1-\omega)T_1 - C_{p,1} - \frac{C_{p,2}}{1+r} \right] \end{aligned} \tag{15}$$

where λ_p is the multiplier. The parent is aware of the fact that child's expenditure on consumption of the composite good and housing is affected when choosing T_1 and depends on whether the child faces a borrowing constraint. The first order conditions with respect to $C_{p,i}$ are

$$\frac{\partial U_1}{\partial C_{p,1}} - \lambda_p = 0 \tag{16}$$

and

$$\beta \frac{\partial U_2}{\partial C_{p,2}} - \frac{\lambda_p}{1+r} = 0 \tag{17}$$

Thus, the standard Euler condition holds for the parent since he (or she) has access to perfect capital markets. Assuming an interior solution for transfers, the first order condition with respect to T_1 is

$$\frac{\partial U_1}{\partial V_1}\frac{\partial V_1}{\partial C_{k,1}}\frac{\partial C_{k,1}}{\partial T_1} + \frac{\partial U_1}{\partial V_1}\frac{\partial V_1}{\partial H}\frac{\partial H}{\partial T_1} + \beta\left(\frac{\partial U_2}{\partial V_2}\frac{\partial V_2}{\partial C_{k,2}}\frac{\partial C_{k,2}}{\partial T_1} + \frac{\partial U_2}{\partial V_2}\frac{\partial V_2}{\partial H}\frac{\partial H}{\partial T_1}\right) - (1-\omega)\lambda_p = 0 \tag{18}$$

The first order condition with respect to λ_p is just equation (4). Equations (4), (16) (18) and the child's optimal decision rules can be used to solve for parent's consumption periods 1 and 2 and the transfer in period 1 as functions of the discounted lifetime incomes of both the parent and child.

4. An Example

In the empirical literature discussed in section 2, many researchers examined the effect of transfers on the value of the house purchased and on the effect of a child's income on intergenerational transfers. In order to derive a simple solution that enables us to put a sign on these effects in the theoretical model discussed in section 3 we choose simple quadratic-utility functions for the child and parent.

4.1 The child's optimisation problem

Assume that the child's utility is given by

$$V = -\frac{1}{2}\left(C_{k,1} - C_k^*\right)^2 - \frac{\gamma}{2}\left(H - H^*\right)^2 + \beta\left(-\frac{1}{2}\left(C_{k,2} - C_k^*\right)^2 - \frac{\gamma}{2}\left(H - H^*\right)^2\right) \qquad (19)$$

where γ is a measure of the importance of housing services in the child's utility function and the starred quantities are "bliss points".

4.1.1 Borrowing constraint is ineffective for the child

In this case the standard Euler equation holds for the child. Solving the first order conditions for $C_{k,i}$ and H gives

$$C_{k,1} = \delta_{k,1}\left(Y_{k,1} + \frac{Y_{k,2}}{(1+r)} + (1-\omega)T_1 - \frac{W}{(1+r)^2}\right) + \text{constant} \qquad (20)$$

$$C_{k,2} = \delta_{k,2}\left(Y_{k,1} + \frac{Y_{k,2}}{(1+r)} + (1-\omega)T_1 - \frac{W}{(1+r)^2}\right) + \text{constant} \qquad (21)$$

and

$$H = \delta_{k,3}\left(Y_{k,1} + \frac{Y_{k,2}}{(1+r)} + (1-\omega)T_1 - \frac{W}{(1+r)^2}\right) + \text{constant} \qquad (22)$$

where the constants are functions of the bliss points. The precise expressions for the δ_i are given in the appendix. The parameters $\delta_{k,1}$ and $\delta_{k,2}$ are positive fractions. The parameter $\delta_{k,3}$ is positive if R_3 is positive. In the case where $\omega = 1$, $T_1 > 0$ and $T_2 = -(1+r)T_1$, equation (5) is binding. An increase in parental transfers in period 1 has no effect on the child's expenditure on either the composite consumption good or housing. This is similar to Ricardian equivalence. All transfers do, is to give the child access to perfect capital markets by operating through the parent.

In the case where $0 \leq \omega < 1$ and $T_1 > 0$ then a 1% increase in parental transfers in period 1 will increase the child's expenditure on the composite consumption good by less than 1% in both periods. If R_3 is positive (negative) an increase in T_1 leads to an increase (decrease) in housing expenditure. So although the child is making money so to speak, if the price of the house increases at a greater rate than the interest rate $(R_3 < 0)$ the only way the intertemporal budget constraint will hold is if there is a reduction the size of the house at the beginning of period 1, given that W is exogenously determined wealth at the end of period 2.

4.1.2 Borrowing constraint is effective for the child

We assume that $\lambda_2 \neq 0$, $T_1 > 0$ and $T_2 = -\omega(1+r)T_1$. In this case the standard Euler equation does not hold for the child. Solving the first order conditions for $C_{k,i}$ and H gives

$$C_{k,1} = \theta_1 Y_{k,1} + \theta_2 \left(Y_{k,2} - \frac{W}{(1+r)} \right) + \theta_3 T_1 + \text{constant} \qquad (23)$$

$$C_{k,2} = \theta_4 Y_{k,1} + \theta_5 \left(Y_{k,2} - \frac{W}{(1+r)} \right) + \theta_6 T_1 + \text{constant} \qquad (24)$$

and

$$H = \theta_7 Y_{k,1} + \theta_8 \left(Y_{k,2} - \frac{W}{(1+r)} \right) + \theta_9 T_1 + \text{constant} \qquad (25)$$

where the constants are functions of the bliss points. The precise expressions for the θ_i are given in the appendix.

The coefficients θ_1, θ_5, and θ_7 are always positive fractions. The sign of the remaining coefficients depend on the sign of R_2 and ω. R_2 is negative if the proceeds from the sale of the house at the end of period 2 are greater than the repayment of the mortgage interest and principal in that period. This would be the case if real house price inflation was nonnegative and the child borrowed less than $1/(1+r)$. If this is true $\theta_2 > 0$, $\theta_4 > 0$, $\theta_8 < 0$ and $\theta_9 > 0$. Even if R_2 is negative θ_3 and θ_6 have an ambiguous sign.

Consider the case where $\omega = 0$ and $T_1 > 0$. The transfer is a gift. If R_2 is negative, then $0 < \theta_3 < 1$ and $0 < \theta_6 < 1$. A 1% increase in parental transfers in period 1 will increase the child's expenditure on the composite consumption good in period's 1 and 2 by less than 1%. In the case where $\omega = 1$, $T_1 > 0$ and $T_2 = -(1+r)T_1$, equation (5) is binding. An increase in parental transfers in period 1 has effects on the child's expenditure on either the composite consumption good or housing. This is unlike the case above where the child did not face a borrowing constraint. Although the signs on θ_3 and θ_6 are still ambiguous we find $\theta_3 > 0$ and $\theta_6 < 0$ using many realistic values of the parameters in the model. Thus, in this case, an increase in transfers in period 1 causes an increase in the child's current consumption, a fall in the child's future consumption, as the child pays back the parental loan, and an increase in the quantity of housing demanded.

In the empirical section below using Irish survey data we can estimate versions of the housing demand equations and the parental transfer equations developed in this section. Before doing so we can get an idea of the relative value of the coefficients by choosing some parameters in the model. In the

sample the average mortgage is 75% of the value of the house, i.e. α=0.75. We set the annual real interest rate to 2%, which has been the approximate rate in Ireland over the last ten years. This would imply that β=0.98. We arbitrarily set P=1. Since many of the transfers in the sample were reported as gifts we set ω=0.0. Estimates of μ and γ are not available. However it seems reasonable to assume that the parent places less weight on the child's utility than their own, so we set μ = 0.5. We assume that the child places equal weight on consumption and housing services, i.e. γ=1.0. In columns 2-4 of Table 1 we present the value of the coefficient of the equations (22) and (25) for three values of the real house inflation rate, -2%, 2% and 4%.[8] When π=2% the coefficient $\delta_{k,3}$ in the equations (22) is zero and for unconstrained house buyers and an increase in transfers will have no affect on the demand for housing. Given that α<1/(1+r) then $\theta_9 > 0$ and an increase in transfers causes an increase in the demand for housing for constrained house buyers regardless of the value of π. An increase in the importance of housing in the child's utility function, γ, makes housing expenditure less responsive to transfers.

4.2 The parent's optimisation problem

Assume that the parent's utility function is

$$\begin{aligned} U = &-\frac{1}{2}\left(C_{p,1} - C_p^*\right)^2 + \mu\left(-\frac{1}{2}\left(C_{k,1} - C_k^*\right)^2 - \frac{\gamma}{2}\left(H - H^*\right)^2\right) \\ &+\beta\left(-\frac{1}{2}\left(C_{p,2} - C_p^*\right)^2 + \mu\left(-\frac{1}{2}\left(C_{k,2} - C_k^*\right)^2 - \frac{\gamma}{2}\left(H - H^*\right)^2\right)\right) \end{aligned} \tag{26}$$

where μ is a measure of the importance of the child's utility in the parent's utility function. Although the child has access to capital markets they may be unable to borrow sufficient funds. The presence of such a constraint can be expected to raise the probability of a transfer as the parent intervenes to help their child reach a desired level of utility. Transfers may also occur in the absence of a liquidity constraint. In such a situation the parent might provide a transfer for house purchase to allow a lower loan-to-value ratio to provide the child with more disposable income on an on-going basis.

The solution for the optimal level of transfer depends whether the child is liquidity constrained. If $\lambda_2 = 0$, $T_1 > 0$ and $T_2 = -\omega(1+r)T_1$ the constraint is not binding. The solution for the optimal level of transfer is

$$T_1 = \phi_1\left(Y_{p,1} + \frac{Y_{p,2}}{(1+r)}\right) - \phi_2\left(Y_{k,1} + \frac{Y_{k,2}}{(1+r)} - \frac{W}{(1+r)^2}\right) + \text{constant} \qquad (27)$$

where the constants are a functions of the bliss points. The coefficients ϕ_i are positive fractions. The precise expressions for the ϕ_i are given in the appendix. When $0 \leq \omega < 1$ the parent is making a partial or full gift of the transfer to the child. The transfer is increasing in the parent's income and decreasing in the child's income in both periods. The latter result is different to that in Cox and Jappelli [5]. In their paper they find that an increase in Y_{k2} holding Y_{k1} constant leads to a less than 1% increase in C_{k1} and thus an increase T_1 given that there is no housing in the model. In our model the child can adjust along two margins in period 1. As the child's own income, $Y_{k,i}$, increases the parent perceives the child as being able to achieve a higher level of utility independently as they are not constrained and so decrease the level of T_1. The equation indicates that π has little effect on the level of T_1 as house price inflation is currently higher than the mortgage rate resulting in negative real expenditure on housing in period 2.

A smaller μ implies that parent's care less about their child's utility. In this case ϕ_1 increases and ϕ_2 decreases (compare column 6 with column 3 in Table 1). The parent gives a smaller transfer per unit of the child's income. An increase in γ does not change the sign of any of these coefficients. In the case where $\omega = 1$ the parent is making a private loan to the child in period 1 which has to be repaid with interest in period 2. In this case the effect of both the parent's and child's income on the level of transfers is indeterminate. As we mentioned above the transfer does not affect the child's expenditure on consumption of the composite good and housing directly but it does so indirectly by synthesizing a perfect capital market for the child, which enables the child to smooth expenditure.

If $\lambda_2 \neq 0$, $T_1 > 0$ and $T_2 = -\omega(1+r)T_1$ the borrowing constraint is effective for the child. The solution for the optimal level of transfer is given by

$$T_1 = \eta_1\left(Y_{p,1} + \frac{Y_{p,2}}{(1+r)}\right) + \eta_2 Y_{k,1} + \eta_3\left(Y_{k,2} - \frac{W}{(1+r)}\right) + \text{constant} \qquad (28)$$

where the constants are a functions of the bliss points. The precise expressions for the η_i are given in the appendix. The coefficient η_1 is a positive fraction. The remaining η_i have an ambiguous sign. We find $0 < \eta_2 < 1$ using many realistic values of the parameters in the model (see Table 1). Thus the parent increases the transfers as the child's current income increases. Although bound by a borrowing constraint, higher current income for the child means a greater ability to repay a transfer.

We also find that η_3 is close to zero. It is only positive when the transfer is a gift and is usually a very small negative number. As with the previous case a smaller μ causes η_1 increase and η_2 decrease (compare column 6 with column 3 in Table 1). The parent gives a smaller transfer per unit of the child's income regardless of whether the child is liquidity constrained. An increase in γ does not change the sign of any of these coefficients.

5. Data Analysis

The analysis uses survey data from a random sample of first-time homebuyers in Ireland who had drawn down a mortgage from *permanent tsb*. This financial institute is one of the largest mortgage providers in Republic of Ireland with approximately a 25 per cent share in the Irish mortgage market. The survey was conducted between November 2004 and February 2005 and 688 questionnaires were completed[9]. The survey asked first time buyers about the details of their mortgage, their savings for a downpayment, sources of non-mortgage funding, some details of the house purchased, some demographic characteristics, the net household income, etc.

About 44% of the sample had taken out a mortgage with *permanent tsb* in 2004, 40% in 2003, 12% in 2002 and the remainder in 2000 and 2001. The euro value of net household income was reported the year 2004 and in the following ranges <€15500, €15500-€19999, €20000-€25999, €26000-€38999, €39000-€46999, €47000-€64999 and > €64999. In order to obtain real household income for the year of house purchase we employed three conversions. First, we used the midpoints of the ranges. For the first income point we used €7,750 and for the open-ended last income point we used an income value of €91,000. Second, we removed the trend in household income by using the growth in national disposable income as a proxy to give us midpoint income for the appropriate year in which the house was purchased. Third we converted the nominal income to real income using the consumer price index. The actual reported house price, loan, downpayment and transfer were those at the time of purchase and we converted the nominal figures to real using the consumer price index.

A dummy variable for a household that we considered liquidity constrained before any parent transfer had been made was constructed. Following Mayer and Engelhardt [18] a constrained household is defined as one that has a downpayment of less than 10% the value of the house and an obligation ratio that is greater than 35%.[10] This reflects mortgage lending policy at most Irish financial institutions. A summary of the data is presented in Table 2. In the second column we present the means for the total sample. We find that 16% of first-time house buyers in the sample are liquidity constrained using our defintion. If one used the precise definition as in Mayer and Engelhardt [18] then 30% of the sample would be classed as liquidity constrained. This is a similar figure to what they find in US data. Almost 34% of the sample received a transfer and the transfer was 21% of the downpayment. The percentage receiving inter vivos transfer in Ireland appears to be 50% higher than what has been found in Italy and the United States. Guiso and Jappelli [16], using Italian data, report that 20% of the sample received an inter vivos transfer. Mayer and Engelhardt [18] find that "only 21 percent of first-time buyers received gifts" and the gift was 12% of the downpayment in the US.

Evidence on parental assistance in the Irish housing market has been mixed. According to the Central Bank of Ireland [2], in an analysis of equity withdrawal in the Irish housing market, "there is

anecdotal evidence of parents making significant contributions to their children for house purchase." Gunne Residential [14] in a survey found that 45 per cent of intending first-time buyer expected to be reliant on parental (or third-party) assistance when they purchased their home and that two thirds of recent first-time buyers received parental/third party assistance to buy their home.[11] However, more recent surveys suggest that the role of parental transfers might not be as widespread. For example, the Irish Mortgage Corporation [17] found that 65 per cent of first-time buyers funded the deposit for their purchase through their own savings, while 28 per cent partly or wholly funded their deposit by way of financial assistance or a transfer from their parents. Similarly Sherry FitzGerald, one of Ireland's largest estate agents, reported that a survey they undertook of first-time buyers of new homes during 2004 found that 49 per cent stated that the deposit was funded by personal savings, 20 per cent funded it through a combination of savings and a gift and only 15 per cent stated that they had received the deposit as a gift from family[12]. Duffy [8], using Irish data, shows that the required downpayment has risen substantially in recent years and is now equivalent to over 50 per cent of personal disposable income.

In columns three and four of Table 2 we present summary data for constrained and unconstrained first-time house buyers. The evidence is similar to that reported in Engelhardt and Mayer [12] and Mayer and Engelhardt [18]. Constrained house buyers tend to buy more expensive homes, have less third level education and have lower household incomes. The low household income is also a reflection that there is a smaller percentage of constrained house buyers that are married and/or made a joint application for a mortgage. Almost two-thirds of constrained house buyers received a transfer. The transfer accounted for 50% of the downpayment of constrained house buyers. This was much higher than the reported figure of 13% for the US. Almost 30% of unconstrained house buyers also received a transfer. Presumably this is for altruistic or merit reasons.

The survey contained a few questions that might indicate financial difficulties. The survey asked house buyers whether the rented out a room in their new home. One might have thought that those who were liquidity constrained might rent out a room. The evidence is that only 6% of the full sample rented out a room and this figure does not vary across the different groupings. The survey also asked house

buyers whether they found the monthly mortgage repayments a burden. A little over half indicated that this was true. There was not much difference between the constrained and unconstrained groups. We calculated the obligation ratio if house buyers could only use their savings and had to borrow the remaining funds and the actual obligation ratio, which would include transfers. As one would expect the obligation ratio for the constrained house buyers would have been 53% without the transfer but was 37% including the transfer. This is a clear indication that without the transfer these first-time buyers would not have been able to get on the property ladder.

In columns five and six of Table 2 we present summary data for those that received a transfer and those who did not receive such a transfer. The evidence is similar to that reported in Mayer and Engelhardt [18]. Those who receive a transfer buy more expensive homes. Those who received a transfer save for a slightly lower amount of time than those who do not. The evidence for the US presented by Mayer and Engelhardt [18] and for Italy presented by Guiso and Jappelli [16] a greater drop in the time spent saving for the downpayment. The transfer represents almost two-thirds of the downpayment of recipients. Those who received transfers tended to buy outside the city, were younger, lived at home and make single applications. Some of this evidence is reflected in the fact that of the 231 who reported receiving a transfer 76 (33%) of these reported receiving a gift of a site to build their home.

We estimate variations of the parental transfer equations (27) and (28). Unfortunately, the survey does not provide data on parent's income and so our estimates will be biased. The same can be said of the empirical work presented by Cox [4] or Engelhardt and Mayer [12]. Studies such as Cox [3] and Ermisch [14] have found increasing parental income improves the probability of receiving a transfer.

A tobit model, censored from below at 0, is used to estimate the impact of different factors on the size of a transfer. The results are presented in columns 2-4 of Table 3 respectively. A probit model is used to estimate the impact of different factors on the probability of receiving a transfer. The results are presented in columns 5-7 of Table 3 respectively. In both versions of the transfer equation the dummy variable indicating a constrained house buyer is positive and very significant. The effect of current real household income on the transfer amount is positive and significant for constrained house buyers. This is

consistent with the theory as η_2 is expected to be positive. The model predicts that η_3 is a small negative number if the transfer is not a one-hundred percent gift (see column 5 of Table 1). If education proxies for future household income, our empirical results are consistent with the theory and suggest that for constrained households education has a negative but insignificant effect on transfers. Although higher recipient income impacting positively on a transfer may initially seem strange, it may well reflect the fact that in some cases these transfers are not gifts but are either loans or subsidies. The rise in house prices has meant that first-time buyers are finding it particularly difficult to overcome borrowing constraints. Therefore, the parent may be prepared to transfer a higher amount, which would allow the child to purchase a dwelling, if they feel that the child is in a better position to repay. The estimated coefficient on the "purchased a house in city" dummy variable is negative and significant. This reflects the fact that a number of transfers were in the form of land.

We find that current real household income and education are insignificant for unconstrained house buyers. These results are also consistent with the theory. If parents have a low weight on the child's utility in their own utility function then the theoretical model predicts that ϕ_2 is a very small positive number. With the exception of age the demographic and education variables are all insignificant, suggesting that transfers are not given for meritorious behaviour.

In the theoretical section of this paper, transfers are serving to underpin first-time buyer demand. We estimate the impact of a transfer on the real value of the dwelling purchased. The results are reported in Table 4. The estimated coefficients on transfers and current real household income are significant and are positive. Both effects are much larger for constrained house buyers. As one might expect the value of the house is higher when a joint application is made or if the dwelling is located in the city. Unexpectedly, buyers with larger families buy less valuable houses.

Although not explicitly covered on our theoretical model the data allows us to examine the impact of a transfer on the size of the downpayment and savings made by a house buyer prior to homeownership. Households receiving transfers can adjust along these margins. The results are reported in Table 5. As

expected, transfers are estimated to have a significant positive (negative) effect on the amount of the downpayment (savings). This is a partial reflection of the fact that transfers increase the value of the house purchased. These results are similar to those reported in Engelhardt and Mayer [12]. For constrained households real income is significant and positive in the downpayment and savings regressions. Most of the other variables are insignificant.

Our dataset also allows us to examine the effects of transfers on the time to save for a downpayment and on the savings rate (i.e. downpayment savings as a percentage of household income). The data on how long it took the household to save for a downpayment is in the following catagories (1) less than one year, (2) one to two years, (3) two to five years and (4) more than five years. In Table 2 we presented the mean time-to-save based on the mid-points of the categories. The ordinary least squares coefficient estimates relating these mid-points to a number of explanatory variables will be inconsistent. When the data is interval coded as it is here an ordered probit is an appropriate method of estimation (see Wooldridge [23] for a discussion of this type of model). In this example the threshold parameters or cut points are known. The maximum likelihood estimates of the parameters in the ordered probit are presented in Table 6. Our results are similar to those reported in Engelhardt and Mayer [12] in the sense that most variables are insignificant for the full sample and the two sub-samples. Households with higher income and younger households spend less time saving. We find that neither the transfer amount or transfer dummy is significant. It may be that in this period of rising house prices and incomes households were saving for a period of time regardless of transfers or that the transfers were not anticipated when households started saving.

Finally in Table 7 we present estimates of the effects of transfers on the savings rate. The savings rate is calculated using the predicted time-to-save (based on the ordered probit estimates) for each household rather than the mid-points savings time. The results suggest that there is a significant negative effect on the savings rate when transfers are modelled using a dummy variable. The effect is insignificant when transfers are represented to a transfer-to-income ratio. This result is probably due to the fact that transfer amounts may be inaccurate and a noisy measure of the true transfer received. Engelhardt and

Mayer [12] show that this would bias the estimated coefficient to zero. These results are similar for the full sample and the two sub-samples. In the full sample we find that constrained households have lower savings rates. In all cases we find that the median house price to income ratio is significant and positively related to the savings rate. We also find that savings rates are higher for older age groups and those that have lower higher education.

6. Conclusions

Recent data indicates that one in three first-time buyers in Ireland receive a transfer from relatives to assist in house purchase, either in the form of a gift or a loan. A theoretical framework to examine the role of such transfers in the housing market is developed in this paper. Inter vivos intergenerational transfers are introduced into a two-life segments model where the recipient consumes a composite good and housing, the donor cares about the recipient's well-being and the donor is dominant in the sense of optimally choosing the amount of transfer. In the theoretical model the importance of determinants on transfers and the effect of these transfers have on housing expenditure depend on whether a recipient household faces borrowing constraints and whether the transfer is in the form of a loan or a gift. The empirical section of the paper has results that generally are supportive of the theoretical framework put forward. The empirical analysis confirms for Ireland, some of the results that have been found in the international literature. Households that are liquidity constrained are more likely to receive transfers. The empirical results imply that inter vivos intergenerational transfers increase the value of the house purchased and the downpayment, and reduces saving.

Appendix A

The parameters in the solution to Case K1 where the borrowing constraint is ineffective for the child are

$$\delta_{k,1} = \frac{\gamma(1+\beta)\beta(1+r)^2}{(R_3P)^2\beta(1+r)^2 + \gamma(1+\beta)\left(\beta(1+r)^2+1\right)} > 0 \tag{A1}$$

$$\delta_{k,2} = \frac{1}{\beta(1+r)}\delta_{k,1} > 0 \tag{A2}$$

$$\delta_{k,3} = \frac{R_3P}{\gamma(1+\beta)}\delta_{k,1} \tag{A3}$$

The parameters in the solution to Case K2 where the borrowing constraint is effective for the child are

$$\theta_1 = \frac{(1+\beta)\gamma + \beta(R_2P)^2}{(1+\beta)\gamma + \beta(R_2P)^2 + (R_1P)^2} > 0 \tag{A4}$$

$$\theta_2 = -\frac{\beta R_1R_2P^2}{(1+\beta)\gamma + \beta(R_2P)^2 + (R_1P)^2} \tag{A5}$$

$$\theta_3 = \frac{(1+\beta)\gamma + \beta(R_2P)^2 + P^2\beta R_1R_2\omega(1+r)}{(1+\beta)\gamma + \beta(R_2P)^2 + (R_1P)^2} \tag{A6}$$

$$\theta_4 = -\frac{\theta_2}{\beta} \tag{A7}$$

$$\theta_5 = \frac{(1+\beta)\gamma + (R_1P)^2}{(1+\beta)\gamma + \beta(R_2P)^2 + (R_1P)^2} > 0 \tag{A8}$$

$$\theta_6 = \theta_4 - \omega(1+r)\theta_5 \tag{A9}$$

$$\theta_7 = \frac{R_1P}{(1+\beta)\gamma + \beta(R_2P)^2 + (R_1P)^2} > 0 \tag{A10}$$

$$\theta_8 = \frac{\beta R_2P}{(1+\beta)\gamma + \beta(R_2P)^2 + (R_1P)^2} \tag{A11}$$

$$\theta_9 = \theta_7 - \omega(1+r)\theta_8 \tag{A12}$$

The parameters in the expression for parental transfers in Case P1 where the borrowing constraint is ineffective for the child are

$$\phi_1 = \left(\frac{\frac{\left(1+\beta\left(1+r\right)^2\right)}{\beta\left(1+r\right)^2}}{\left(1-\omega\right)\left(\mu\delta_1^2 + \beta\mu\delta_2^2 + \gamma\left(1+\beta\right)\mu\left(R_3\delta_3\right)^2 + \frac{\left(1+\beta\left(1+r\right)^2\right)}{\beta\left(1+r\right)^2} \right)} \right) > 0 \qquad \text{(A13)}$$

$$\phi_2 = \left(\frac{\mu\delta_1^2 + \beta\mu\delta_2^2 + \gamma\left(1+\beta\right)\mu\left(R_3\delta_3\right)^2}{\left(1-\omega\right)\left(\mu\delta_1^2 + \beta\mu\delta_2^2 + \gamma\left(1+\beta\right)\mu\left(R_3\delta_3\right)^2 + \frac{\left(1+\beta\left(1+r\right)^2\right)}{\beta\left(1+r\right)^2} \right)} \right) > 0 \qquad \text{(A14)}$$

The parameters for parental transfers in Case P2 where the borrowing constraint is effective for the child are

$$\eta_1 = \frac{\frac{\left(1-\omega\right)\beta\left(1+r\right)^2}{\mu\left(1+\beta\left(1+r\right)^2\right)}}{\left(\theta_3^2 + \beta\theta_6^2 + \gamma\left(1+\beta\right)\theta_9^2 + \left(1-\omega\right)\frac{\left(1-\omega\right)\beta\left(1+r\right)^2}{\mu\left(1+\beta\left(1+r\right)^2\right)} \right)} > 0 \qquad \text{(A15)}$$

$$\eta_2 = \frac{\theta_1\theta_3 + \beta\theta_4\theta_6 + \gamma\left(1+\beta\right)\theta_7\theta_9}{\left(\theta_3^2 + \beta\theta_6^2 + \gamma\left(1+\beta\right)\theta_9^2 + \left(1-\omega\right)\frac{\left(1-\omega\right)\beta\left(1+r\right)^2}{\mu\left(1+\beta\left(1+r\right)^2\right)} \right)} \qquad \text{(A16)}$$

$$\eta_3 = \frac{\theta_2\theta_3 + \beta\theta_5\theta_6 + \gamma\left(1+\beta\right)\theta_8\theta_9}{\left(\theta_3^2 + \beta\theta_6^2 + \gamma\left(1+\beta\right)\theta_9^2 + \left(1-\omega\right)\frac{\left(1-\omega\right)\beta\left(1+r\right)^2}{\mu\left(1+\beta\left(1+r\right)^2\right)} \right)} \qquad \text{(A17)}$$

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Table 1: Parameters in the housing and transfer equations

α			0.750			
r			0.020			
β			0.980			
P			1.000			
π	-0.020	0.020	0.040	0.040	0.040	0.040
ω	0.000	0.000	0.000	0.100	0.000	0.000
μ	0.500	0.500	0.500	0.500	0.200	0.500
γ	1.000	1.000	1.000	1.000	1.000	2.000
δ_3	0.020	0.000	-0.010	-0.010	-0.010	-0.005
θ_7	0.127	0.125	0.123	0.123	0.123	0.064
θ_8	-0.090	-0.125	-0.142	-0.142	-0.142	-0.074
θ_9	0.127	0.125	0.123	0.138	0.123	0.064
ϕ_1	0.887	0.887	0.887	0.986	0.952	0.887
ϕ_2	0.113	0.113	0.113	0.126	0.048	0.113
η_1	0.511	0.511	0.511	0.508	0.723	0.507
η_2	0.489	0.489	0.489	0.539	0.277	0.493
η_3	0.012	0.017	0.019	-0.032	0.011	0.010

Table 2: Summary of data

	Total	Constrained	Not constrained	Transfer	No transfer
Constrained housebuyers	15.99%	100.00%	0.00%	29.44%	9.19
Received transfer	33.58%	61.81%	28.20%	100.00%	0.00%
Household income (2004 €)	€43,324	€27,750	€46,287	€42,111	€43,937
House price (2004 €)	€196,493	€228,933	€190,318	€205,347	€192,017
Downpayment %	24.07%	32.12%	22.54%	31.57%	20.28%
Percent from saving	77.17%	47.27%	82.86%	35.90%	98.03%
Percent from transfer	21.23%	50.98%	15.57%	63.24%	0.00%
Time to save downpayment (years)	3.84	3.86	3.84	3.67	3.91
Rent a room in new house (%)	5.99%	4.95%	6.26%	3.93%	7.03%
Find repayments a burden (%)	56.54%	60.00%	55.88%	61.47%	54.05%
Obligation ratio if no transfer (%)	27.52%	52.97%	22.68%	33.43%	24.54%
Obligation ratio if transfer (%)	23.87%	37.39%	21.30%	22.56%	24.54%
Male (%)	66.42%	60.00%	67.65%	64.50%	67.40%
Married (%)	62.00%	49.54%	64.23%	62.88%	61.40%
Age (Years)	30.28	31.13	30.12	29.45	30.70
Third level education (%)	55.83%	43.64%	58.16%	56.96%	55.26%
Household size (persons)	2.25	2.20	2.26	2.28	2.24
Renter (%)	40.03%	30.84%	41.75%	32.89%	43.58%
Joint application for mortgage (%)	65.41%	56.36%	67.13%	66.23%	64.99%
Purchased house in city (%)	27.70%	33.03%	26.69%	22.08%	30.55%
Purchased new house (%)	59.30%	57.27%	59.69%	61.47%	58.21%
Purchased detached house (%)	35.61%	41.82%	34.43%	46.32%	30.20%
Expect house prices to increase	78.71%	77.14%	79.00%	79.47%	78.31%
Term of loan (Years)	27.05	26.25	27.20	27.43	26.85
Used a FRM (%)	74.42%	71.03%	75.04%	74.78%	74.23%
Used a mortgage broker (%)	60.50%	65.14%	59.62%	61.30%	60.09%
Number of observations	688	110	578	231	457

Table 3: Tobit and probit models of the determinants of the transfer

Dependent variable	Transfer amount (000s)			Transfer received (1=yes)		
	Total	Constrained	Not Constrained	Total	Constrained	Not Constrained
Constrained housebuyers	119.276			1.034		
	(10.847)			(6.555)		
Median house price	0.714	1.376	0.268	0.007	0.009	0.005
	(2.310)	(1.599)	(1.102)	(1.782)	(0.841)	(1.219)
Household income	0.599	6.571	0.182	0.004	0.040	0.001
	(2.451)	(5.033)	(0.979)	(1.180)	(2.118)	(0.331)
Male	-6.905	-32.928	-0.943	-0.116	-0.336	-0.077
	(-0.792)	(-1.441)	(-0.131)	(-0.991)	(-1.059)	(-0.594)
Married	9.681	21.162	3.558	0.156	0.536	0.103
	(0.780)	(0.576)	(0.358)	(0.931)	(1.091)	(0.562)
Age	-1.144	2.891	-2.108	-0.028	0.027	-0.042
	(-1.596)	(1.723)	(-3.253)	(-2.810)	(1.099)	(-3.570)
Third level education	0.096	-30.258	3.263	0.074	-0.265	0.130
	(0.011)	(-1.275)	(0.460)	(0.636)	(-0.808)	(1.013)
Household size	4.018	6.389	2.216	0.023	-0.020	0.023
	(1.166)	(0.667)	(0.790)	(0.484)	(-0.153)	(0.455)
Renter	-19.625	-51.748	-11.514	-0.189	-0.329	-0.184
	(-2.261)	(-1.920)	(-1.666)	(-1.633)	(-0.900)	(-1.469)
Joint application	-8.473	-81.711	3.947	-0.037	-1.063	0.125
	(-0.675)	(-2.233)	(0.384)	(-0.220)	(-2.172)	(0.665)
Purchased house in city	-33.111	-75.434	-22.315	-0.291	-0.878	-0.210
	(-3.446)	(-3.014)	(-2.794)	(-2.283)	(-2.683)	(-1.471)
House price appreciation	2.049	9.946	1.088	0.052	0.192	0.096
	(0.211)	(0.400)	(0.135)	(0.390)	(0.532)	(0.651)
Rent a room in house	-26.316	-30.799	-11.055	-0.249	0.366	-0.288
	(-1.384)	(-0.596)	(-0.719)	(-1.012)	(0.559)	(-1.040)
Repayments a burden	11.717	-22.811	11.826	0.197	-0.123	0.187
	(1.420)	(-0.976)	(1.768)	(1.779)	(-0.384)	(1.540)
Constant	-178.511	-388.307	-40.903	-1.322	-2.281	-0.635
	(-2.776)	(-2.417)	(-0.784)	(-1.587)	(-1.129)	(-0.677)
Number of observations	640	97	543	640	97	543

Notes to the table: The t-statistics are in parenthesis.

Table 4: The effect of transfers on house value (000s)

	Total	Constrained	Not Constrained
Constrained housebuyer	29.296		
	(5.334)		
Transfer amount (000s)	0.405	0.434	0.285
	(10.051)	(8.571)	(3.372)
Median house price (000s)	0.374	0.018	0.460
	(3.393)	(0.066)	(3.139)
Household income (000s)	0.782	2.191	0.776
	(6.067)	(4.363)	(6.260)
Male	8.369	7.534	9.437
	(2.073)	(0.987)	(2.015)
Married	6.694	18.855	3.556
	(1.185)	(1.659)	(0.540)
Age	0.029	-1.629	0.239
	(0.081)	(-2.811)	(0.622)
Third level education	10.538	14.950	8.494
	(2.664)	(1.919)	(1.830)
Household size	-7.291	-4.393	-7.883
	(-3.152)	(-1.392)	(-4.204)
Renter	-4.428	2.266	-5.084
	(-1.091)	(0.251)	(-1.128)
Joint application for mortgage	11.537	22.370	9.886
	(1.960)	(1.926)	(1.459)
Purchased house in city	42.741	41.266	43.013
	(8.812)	(5.013)	(8.429)
Expect house prices to increase	1.410	-3.228	0.077
	(0.320)	(-0.381)	(0.015)
Rent a room in new house	5.474	-9.308	6.108
	(0.693)	(-0.559)	(0.655)
Find repayments a burden	5.324	22.312	5.493
	(1.381)	(2.859)	(1.259)
Constant	57.693	135.625	42.830
	(2.447)	(2.577)	(1.350)
Number of observations	640	97	543

Notes to the table: The t-statistics are in parenthesis.

Table 5: The effect of transfers on the downpayment and savings

Dependent variable	Downpayment (000s)			Savings (000s)		
	Total	Constrained	Not Constrained	Total	Constrained	Not Constrained
Constrained housebuyers	-20.579			-20.605		
	(-6.928)			(-6.970)		
Transfer amount	0.922	0.971	0.836	-0.080	-0.026	-0.175
	(40.709)	(89.456)	(11.355)	(-3.570)	(-2.336)	(-2.381)
Median house price	0.108	0.005	0.153	0.109	-0.012	0.155
	(1.297)	(0.092)	(1.194)	(1.322)	(-0.202)	(1.220)
Household income	-0.023	0.247	-0.012	-0.036	0.252	-0.027
	(-0.236)	(2.294)	(-0.108)	(-0.371)	(2.281)	(-0.246)
Male	5.449	-1.693	6.969	5.443	-2.138	7.112
	(1.557)	(-1.035)	(1.706)	(1.555)	(-1.275)	(1.747)
Married	-4.714	0.675	-6.014	-5.104	0.461	-6.438
	(-0.972)	(0.277)	(-1.048)	(-1.049)	(0.185)	(-1.125)
Age	0.998	-0.214	1.178	1.015	-0.195	1.186
	(3.601)	(-1.725)	(3.518)	(3.666)	(-1.530)	(3.556)
Third level education	-5.370	-0.263	-6.901	-5.392	-1.284	-6.756
	(-1.628)	(-0.158)	(-1.705)	(-1.635)	(-0.750)	(-1.675)
Household size	-1.915	-0.744	-2.159	-1.845	-0.574	-2.106
	(-1.750)	(-1.100)	(-1.320)	(-1.692)	(-0.828)	(-1.291)
Renter	-1.323	0.491	-1.567	-1.037	1.083	-1.340
	(-0.393)	(0.253)	(-0.398)	(-0.308)	(0.545)	(-0.342)
Joint application	-1.339	4.621	-2.096	-1.199	3.837	-1.775
	(-0.247)	(1.856)	(-0.355)	(-0.220)	(1.503)	(-0.301)
Purchased house in city	0.783	2.875	0.692	0.548	2.806	0.339
	(0.226)	(1.630)	(0.155)	(0.159)	(1.552)	(0.076)
House price appreciation	2.859	1.469	2.622	2.734	1.147	2.542
	(0.877)	(0.810)	(0.573)	(0.839)	(0.617)	(0.558)
Rent a room in house	1.760	-0.449	1.798	2.147	0.142	2.271
	(0.255)	(-0.126)	(0.221)	(0.311)	(0.039)	(0.280)
Repayments a burden	-1.499	2.536	-0.751	-1.582	2.472	-0.848
	(-0.464)	(1.516)	(-0.197)	(-0.491)	(1.442)	(-0.224)
Constant	-7.504	8.324	-19.342	-8.064	11.245	-19.994
	(-0.464)	(0.738)	(-0.699)	(-0.499)	(0.973)	(-0.725)
Number of observations	640	97	543	640	97	543

Table 6: Maximum likelihood estimates of the effect of transfers on time-to-save for downpayment

	Total	Constrained	Not Constrained	Total	Constrained	Not Constrained
Constrained housebuyers	-0.527			-0.354		
	(-1.343)			(-1.010)		
Transfer amount	0.002	0.001	0.001			
	(0.755)	(0.433)	(0.217)			
				-0.201	-0.556	-0.184
				(-0.864)	(-0.322)	(-0.902)
Median house price	0.000	-0.014	0.001	0.001	-0.005	0.001
	(0.034)	(-0.754)	(0.105)	(0.155)	(-0.287)	(0.158)
Household income	-0.021	0.014	-0.021	-0.020	0.028	-0.021
	(-3.249)	(0.428)	(-4.310)	(-3.220)	(0.393)	(-4.162)
Male	0.190	0.784	0.106	0.167	0.594	0.101
	(0.791)	(1.871)	(0.548)	(0.727)	(0.401)	(0.502)
Married	-0.021	-0.149	-0.002	-0.011	-0.066	0.003
	(-0.063)	(-0.260)	(-0.008)	(-0.034)	(-0.093)	(0.009)
Age	0.070	0.091	0.066	0.068	0.097	0.065
	(3.341)	(1.562)	(3.898)	(3.366)	(1.274)	(3.704)
Third level education	0.174	0.059	0.186	0.169	0.007	0.192
	(0.701)	(0.090)	(0.928)	(0.689)	(0.005)	(0.905)
Household size	-0.060	-0.137	-0.042	-0.057	-0.176	-0.042
	(-0.347)	(-0.564)	(-0.327)	(-0.325)	(-0.250)	(-0.299)
Renter	0.141	-0.742	0.226	0.125	-0.801	0.216
	(0.544)	(-0.928)	(1.132)	(0.502)	(-0.339)	(1.043)
Joint application	-0.400	0.194	-0.449	-0.398	-0.016	-0.436
	(-1.253)	(0.437)	(-1.701)	(-1.275)	(-0.026)	(-1.586)
Purchased house in city	-0.205	-0.925	-0.087	-0.254	-1.175	-0.101
	(-0.691)	(-1.336)	(-0.377)	(-0.896)	(0.000)	(-0.420)
House price appreciation	0.042	0.018	-0.015	0.030	0.251	-0.016
	(0.164)	(0.024)	(-0.077)	(0.121)	(0.000)	(-0.078)
Rent a room in house	-0.498	1.034	-0.486	-0.513	0.812	-0.499
	(-0.877)	(0.000)	(-1.168)	(-0.969)	(0.000)	(-1.172)
Repayments a burden	-0.188	0.441	-0.236	-0.158	0.382	-0.221
	(-0.796)	(0.983)	(-1.253)	(-0.690)	(0.264)	(-1.124)
Constant	2.979	2.974	3.035	2.963	1.420	3.081
	(2.110)	(0.982)	(2.677)	(2.161)	(0.000)	(2.631)
Number of observations	508	68	440	508	68	440

Table 7: The effect of transfers on the savings rate

	Total	Constrained	Not Constrained	Total	Constrained	Not Constrained
Constrained housebuyers	-0.144			-0.126		
	(-4.793)			(-4.630)		
Transfer amount to	-0.002	-0.004	-0.006			
Income ratio	(-0.195)	(-1.152)	(-0.286)			
Transfer dummy				-0.087	-0.021	-0.096
				(-4.963)	(-1.145)	(-3.274)
Median house price to	0.023	0.010	0.030	0.024	0.011	0.031
Income ratio	(3.680)	(3.595)	(4.939)	(3.557)	(4.479)	(5.569)
Male	0.014	-0.042	0.031	0.010	-0.043	0.027
	(0.590)	(-2.206)	(1.054)	(0.404)	(-2.363)	(0.940)
Married	-0.032	0.053	-0.053	-0.030	0.063	-0.051
	(-1.041)	(1.890)	(-1.310)	(-0.981)	(2.385)	(-1.291)
Age	0.005	-0.005	0.005	0.005	-0.005	0.005
	(2.010)	(-3.087)	(2.178)	(1.813)	(-3.171)	(1.865)
Third level education	-0.058	-0.018	-0.065	-0.056	-0.018	-0.060
	(-2.435)	(-0.937)	(-2.307)	(-2.403)	(-0.984)	(-2.180)
Household size	-0.009	0.008	-0.012	-0.010	0.007	-0.013
	(-1.190)	(1.001)	(-1.082)	(-1.398)	(0.845)	(-1.131)
Renter	-0.041	0.051	-0.045	-0.045	0.040	-0.049
	(-1.728)	(2.105)	(-1.618)	(-1.907)	(1.728)	(-1.798)
Joint application	-0.039	0.007	-0.033	-0.032	-0.003	-0.021
	(-1.093)	(0.240)	(-0.778)	(-0.905)	(-0.089)	(-0.504)
Purchased house in city	0.039	0.083	0.036	0.034	0.088	0.033
	(1.464)	(3.976)	(1.215)	(1.287)	(4.597)	(1.125)
House price appreciation	0.021	-0.018	0.019	0.020	-0.024	0.019
	(0.881)	(-0.752)	(0.576)	(0.874)	(-1.025)	(0.608)
Rent a room in house	0.032	-0.081	0.016	0.037	-0.046	0.015
	(0.563)	(-1.983)	(0.303)	(0.634)	(-1.165)	(0.288)
Repayments a burden	0.004	0.025	0.004	0.011	0.017	0.010
	(0.164)	(1.330)	(0.163)	(0.465)	(0.930)	(0.385)
Constant	0.018	0.195	0.003	0.054	0.196	0.038
	(0.197)	(2.888)	(0.027)	(0.604)	(3.198)	(0.402)
Number of observations	508	68	440	508	68	440

[1] For example, Irish Times article, March 2004, "Parents prop up property market".

[2] Over the period 1995 to 2004 new house prices rose by an annual average of 13 per cent in nominal terms and by 9.4 per cent in real terms. Partly as a consequence of this rapid house price inflation the ratio of new house prices to average industrial earnings virtually doubled, from a ratio of 4.3 in 1995 to 8.5 in 2004.

[3] Artle and Varaiya [1] show that consumers keen to owner-occupy will reduce consumption to accumulate the required downpayment.

[4] Based on Muth [19], Olsen [20] and Poterba [21], inter alia.

[5] Time preference may well be an important factor when considering private transfers. According to Cox [4] linkages between parents and children "open up the possibility that consumers who would otherwise be liquidity-constrained can pursue nonliquidity-constrained consumption plans by receiving private transfers. The timing of these transfers is important. They must occur when the recipient's optimal consumption exceeds his current income." A potential first-time buyer would prefer to "consume" housing now rather than wait until income or saving permit the purchase of a dwelling.

[6] For simplicity, it is assumed that the mortgage and the loan have an infinite term.

[7] In some cases in Ireland the parent releases equity in their own home by obtaining an amount T_1 from a lending institution, gives this amount to their child who repays the lending institution directly.

[8] In the survey, respondents were asked if they thought house prices would change in the next year and by how much. The average nominal house inflation rate reported was 6% and inflation was 2%.

[9] Duffy and Quail [9] provided the survey data for the empirical section of this paper.

[10] Mayer and Engelhardt [17] use US data and define a constrained household as one that has a downpayment of less than 20% and an obligation ratio greater than 28%.

[11] Gunne Residential/ICS survey [14], quoted in Irish Times Property Supplement, May 15th, 2003

[12] Sherry FitzGerald Group Press Release October 13th, 2004.