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The THIRD Way in Empirical Economics Research

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Abstract

There is a third way of doing empirical work in economics that combines the benefits of the two commonly described approaches (quasi-experimental (QE) and structural). It uses an economic model to provide interpretability and help in deciding on controls and the nature and solutions to endogeneity problems, but utilizes an approximation to get to an empirical specification that allows for QE-type assessments of identifying data variation. This approach is used in some of the most influential papers in applied economics. This paper makes the case for recognizing this as a specific approach to begin a discussion on improving implementation.

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1 Introduction

Approaches to empirical work in economics are often characterised as fitting into one of two paradigms: experimental/quasi-experimental approaches; and structural approaches. Both approaches have strengths and weaknesses. The quasi-experimental (QExp) approach focuses attention on understanding what data variation is actually being used to identify estimated parameters. But it is often criticized as delivering estimates that are hard to interpret and not providing answers to the questions that need answering (or, at least, only to a subset of them). Structural approaches, in contrast, have strengths in interpretability and fit more easily with some key features that characterize important economic questions: recognizing and reckoning with general equilibrium effects, dynamics, and expectations. On the other side of the ledger, the models involved in structural work tend to be highly nonlinear and opaque, making it difficult to see the source of data variation that is identifying key parameters and raising concerns that the model's form, in fact, is imposing answers.

I believe the polarized narrative comes with an important cost. It has taken us away from recognizing that there is a third way of doing empirical work in economics that, at its best, can combine the benefits of both of the poles. It is an approach in which an explicit economic model is specified (providing interpretability and other benefits that I will discuss), but what is actually taken to the data is a linear or otherwise simple specification that allows for assessments of the use of data variation as in the QExp approach. I will argue that this approach is actually quite common, with some of the most influential papers in applied economics fitting in this mould. Arguing that not naming and recognizing this as an approach is a problem might just be seen as an act of petty jealousy (why don't the researchers taking this approach get to have a cool name and interesting fights?). But I think that not focusing on it as a specific approach means that we haven't done enough to codify and share a body of knowledge on how to do empirical work in this way. Such sharing is important because mixing theory and data work in this way involves complex trade-offs and developing more consistent practices would be useful.

From here on, I will refer to this alternative approach as the THeory Influenced Research Design Way of doing empirical work (the THIRD Way). It starts from a recognition that key concerns motivating both of the two extremes are legitimate but that they have extra implications that are not generally given attention. From the QExp side comes the recognition that what data variation is used to pin down a specific estimated statistic matters for credibility (the source of their own name for themselves - the credibility revolution). The response to that concern has focused much attention on the nature of instrumental variables and the types of fixed effects included in generalized difference in differences approaches.

But it also implies that what we control for in any estimation matters - a lot. Standard Frisch-Waugh arguments indicate that the identifying variation used to pin down a key parameter estimate in a regression varies with the set of other included controls. This is a reflection of what any empirical practitioner knows - what we control for can shift estimates of key parameters that are our main focus to a considerable degree. But if that is true, then we need some basis for deciding on what to control for. THIRD Way papers find that basis in economic theory.

From the Structural side comes a focus on being precise about exactly what is being estimated and how it relates to other economic entities. The Structural approach also brings a focus on what is in the error term - a central element in most structural models (Reiss and Wolak (2007)). Third Way papers, similarly, take both of these issues seriously. They also start from targeted parameters defined in terms of specific elements of economic theories. At the same time, they often frame discussions in terms of types of treatment effects in order to take advantage of the large applied econometric literature that has been built around those effects - although, THIRD Way papers relate them to economic parameters. They employ specificity about the content of the error term to describe both the scope of threats to identification and the nature of potential solutions. While this may seem antithetical to the QExp approach, arguing that an endogeneity issue exists, in a regression context, is an argument about the relationship of the error term to included covariates. Proposed responses, such as instruments, involve assumptions about the content of the error term and, so, all papers employing these techniques are implicitly making arguments about that content. Of course, since the error term is, by definition, unobservable, we need some basis outside of the data for discussing it. Again, THIRD Way papers find that basis in economic theory - a common framework familiar to all economists. Thus, theory provides a transparent basis for describing the assumptions under which an estimator is valid.

A standard THIRD Way paper incorporates these concerns in an approach that incorporates three main components:

1) The Model. The first part of the paper looks like a structural paper in that it is centred on a specific model. What I mean by a specific model is one that has content that will restrict how we work with the data, not a general, vague statement that, say, one could view the problem through a human capital lens. As always, what a model provides is a logical structure for relating outcomes of interest to key driving forces and, from that, indicating what parameters we need to estimate in order to get a clear understanding of the functioning of that structure. That is, it helps us to be precise about the question we are asking and about how to interpret whatever we estimate. In THIRD Way papers, the goal

is to get the advantage of this precision without imposing the structure of specific functional forms in ways that make the identifying data variation hard to discern. For that reason, the theory is often stated in a general form that emphasizes its core logic rather than, say, the specific non-linearities associated with a specific objective function.

2) Approximation. In the second component, key relations that capture the main content of the model (for example, first order conditions) are approximated. This takes us to a form that is likely linear but whose main feature is that one can implement it in a way that allows us to access the lessons from the Credibility Revolution. In particular, we are able to state clearly what data variation is being used to identify the key parameters and to make arguments such as, particular instruments are identifying effects for particular marginal groups. In this sense, the approximation could be non-linear but its extent of non-linearity is restricted by the requirement that we can still operate in the data variation credibility world. Importantly, the approximation is done in such a way that the parameters in the resulting empirical specification maintain interpretability under the theory. Thus, the approximation is the bridge that allows us to move to an empirical specification that avoids imposing the non-linear structure of theory that is often seen as obscuring discussions of identifying variation in Structural work while having parameters that are interpretable under economic theory, avoiding charges levelled at QExp work that what is being estimated has no discernible content.

The approximation element has not been subject to a coherent debate in this literature. As I will argue, one can view the approximation as imposing a restriction on the set of theoretical models under which the parameters in the resulting empirical specification maintain interpretability for wide ranges of data. A linear specification of a behavioural equation relating to one element of a larger problem (e.g., labour supply in a broader household utility maximization problem) often implies separability in a utility function, for example. (Blundell and Walker (1986), Low and Meghir (2017)) Future discussions will need to focus both on how to do the approximation and the situations in which the trade-off it implies between transparency in the employed data variation and the restrictions implied for the theory is acceptable. That is, there needs to be a discussion about the types of economic problems where one can use a THIRD Way approach and the types where Structural approaches are called for. I start that discussion and provide some potential norms to guide the implementation of approximations.

3) Empirical Specification. Having worked with a model to derive key equations and then linearized them, we have a candidate empirical specification. The next step is to make concrete decisions about that specification given the available data and then to take that

specification to the data. This involves issues that might seem mechanical but can often be addressed in a consistent way by referring to the theory such as how to construct the outcome and other variables from the data. It is at this stage that the two main issues raised earlier are addressed - what to control for and what is in the error term (and from that, the nature of and solutions to identification challenges). Thus, it is at this stage we will discuss what data variation we will use to identify the parameters of interest and what estimator allows us to best implement that variation. All of this requires reference back to the theory. It is that reference that differentiates THIRD Way from QExp papers. Both focus on the choice of identifying data variation but in the THIRD Way approach, that variation is being chosen because, viewed within the context of the theory, it identifies specific, interpretable parameters or combinations of parameters.

I view this difference, in part, as being about transparency. Because the THIRD Way approach requires specifying a model and deriving the estimating equation, employing it requires the researcher to give a direct account of why they are using certain controls, what they consider to be the endogeneity concerns and why, in light of what is in the error term, they are adopting their specific remedies. Of course, laying out our theoretical assumptions clearly also highlights their limitations. It requires researchers, in the best implementations, to be clear on the conditions under which their estimates bear the implications they wish to claim and on what next steps might allow for more flexible or general claims.

By now it should be obvious that the THIRD Way approach borrows heavily from both the QExp and Structural approaches, while being quite different from either. My attempt to describe and clarify the THIRD Way approach is not an attempt to open a third front in the estimation approach war. There is value in all three approaches. While I have stressed the usefulness of theory in guiding empirical work, there is great value in empirical studies that focus on gathering new moments - moments that may cause us to shift to new classes of models. The Card and Krueger results on the impact of minimum wages on employment is a classic case in point. On the other side, there will be some economic problems - characterized by the combination of relevant models and data variation - where the non-linearities in the models are of important practical importance. In those cases, we would want structural estimation. At the very least, it is not possible to know which economic problems fall into this situation without someone estimating the structural models. Thus, in any area of empirical economic investigation, it will be useful to have all three approaches and, as I said earlier, it will be helpful to develop some guidelines on when the THIRD Way would be the preferred way.

As I said at the outset - the THIRD Way is actually quite a common approach in empir-

ical micro economics. As a small sample (focused on labour and public finance economics since those are the areas with which I am most familiar): The examination of labour supply responses to tax reforms in Blundell et al. (1998) starts from a theoretically consistent labour supply function from Blundell and Walker (1986) and builds arguments for a specific set of fixed effects and controls based on the theoretically implied content of the error term. Its discussion of the source of identifying variation is very much like a QExp paper. Lemieux et al. (1994)'s study of the impact of taxes on work in the underground economy, which has a first, data investigation part and a second part, still using linear estimators but with the estimator derived from linearization of a theoretical model. Dustmann et al. (2012)'s investigation of the impact of immigration on native born wages in which they use theory to derive an estimation approach that recognizes that reported skills and the skills that immigrants are actually able to implement could differ.(see also, Dustmann et al. (2017))Beaudry et al. (2012)'s study of the impact of outside options in wage setting, in which the measure of the outside option, the instrumental variables for it and the set of controls are derived from the theory and the identification discussion is about data variation in the style of a QExp paper. Amior and Manning (2018)'s investigation into persistent geographic differences in employment to population ratios, which they build around an equilibrium model with local production and migration. Amior and Stuhler (2025)'s examination of immigration impacts on non-immigrant wages, using a monopsony model with dynamics to steer attention to heterogeneity across the distribution of firms. Bertelme et al. (2025)'s study of economies of scale effects and their relationship to industrial policy. All of these papers start from explicit theoretical models but the estimation is linear IV.

In addition to that type of linearized papers, there are papers that use other types of approximations and/or work with different types of estimators. The classic papers, Blundell et al. (2008) on consumption inequality and partial insurance and Guiso et al. (2005)'s investigation of the sharing of temporary and permanent productivity shocks through wage setting use higher order moments of the error process to obtain identification. Ashworth et al. (2018) examines returns to experience and education using a multinomial logit specification in which the underlying index functions are assumed linear and QExp type identifying arguments are used even though the estimator is not linear. Kroft et al. (2025) investigate wage setting in a setting with imperfect competition in both the labour and product markets and use a regression discontinuity research design related to an auction for construction contracts to identify a key parameter.

Finally, it is worth pointing out what the THIRD Way approach is not. It does not include papers in which there is a linear estimator of some kind and then, generally at the end of the paper, some discussion of economic models the results might match. In the THIRD

Way approach, the theory has a central use to argue for the specific set of controls being used and for both the nature of and solutions to endogeneity problems. It is not an afterthought. THIRD Way papers are also not full Structural papers in that they minimize the effect of non-linearities in their identification schemes. The line between THIRD Way and Structural papers can be somewhat unclear, though, especially given that there are papers that use THIRD Way approaches to estimate one component of a complete model (e.g., Attanasio et al. (2018))

The remainder of the paper consists of three broad parts. In the first, I draw out the commonalities of the papers just listed to describe the three components of THIRD Way papers: model, approximation, and empirical specification/identification. In the second part, I discuss when a THIRD Way approach is more likely to be useful relative to the other two possibilities. And in the third part, I talk about where the approach is less well specified and potential paths forward.

2 Components of THIRD Way Papers

In this section, I describe the main components of THIRD Way papers in order both to define what papers would be listed under this approach and to help potential practitioners understand how the approach is implemented. Given the claim at the heart of the approach that theory matters in empirical work in practical ways, describing the approach is best done in the context of specific models. I will mainly use MaCurdy (1981) as a core example but also refer to other papers. I chose MaCurdy (1981) as the main example because it is a clear example of the THIRD Way but also to emphasize that this approach is actually hiding in plain sight - it has been used for a long time and in important papers.

2.1 The Model

THIRD Way papers are centred around an economic model. In Structural papers, the goal is typically to estimate and/or calibrate the model in order to use it to perform welfare analyses of policies or counterfactual exercises. As we will discuss, THIRD Way papers involve estimation of only part of the economic environment (and an approximated one at that) and, so, generally, have more limited welfare analysis and counterfactual exercises. The point is less to construct a complete world to investigate than to use the theory to guide the estimation of key parameters or policy impacts.

In this context, the model's first job in a THIRD Way paper is to provide a basis for precision about the target of the estimation. MaCurdy (1981) provides a clear example of this role. In that paper, the model is one of an individual seeking to maximize lifetime utility in a world of perfect certainty. That is, the problem is to choose paths for leisure and consumption to maximize:

$$\sum_{t=0}^{T} \frac{1}{(1+\rho)^t} U(C(t), L(t)) \tag{1}$$

s.t.,

$$A(0) + \sum_{t=0}^{T} \frac{1}{(1+r)^t} W(t)N(t) = \sum_{t=0}^{T} \frac{1}{(1+r)^t} C(t) \tag{2}$$

where, $U(.,.)$ is the per period utility function, ρ is the person's rate of time preference, r is the interest rate, $C(t)$ is consumption (which is the numeraire) at age t, $L(t)$ is leisure, $N(t) = 1 - L(t)$ is hours of work (with time in each period normalized to 1), and $W(t)$ is the hourly wage.

Standard first order conditions implicitly define consumption and hours of work functions:

$$C(t) = C((\frac{1+\rho}{1+r})^t \lambda_0, W(t)) \tag{3}$$

$$N(t) = N((\frac{1+\rho}{1+r})^t \lambda_0, W(t)) \tag{4}$$

where, λ_0 is the marginal utility of wealth at the outset of life adjusted by the difference between the person's preference over time and the interest rate. Substituting these back into the lifetime budget constraint, (2), reveals that λ_0 is a function of: $A(0)$, ρ, r, the lifetime path of wages, and preferences. That is, it encapsulates everything about the individual's problem. Holding it constant, holds all of that constant.

We are now in a position to more carefully define what we are trying to identify. MaCurdy focuses on two elasticities that matter for understanding labour supply choices of individuals in a life cycle setting. The first is the intertemporal elasticity of substitution:
$\delta = \frac{\partial \ln N}{\partial \ln W}|_{\lambda_0}$
This reveals how an individual alters their hours of work in response to an increase in the wage that is known in advance. It is about how people arrange their work over their lifetime, working harder in periods when wages are higher.

The second is the uncompensated elasticity of substitution. Let $\ln W(t) = \ln \tilde{W}(t) + b\alpha(t)$, where $\alpha(t)$ equals 1 in periods with a shift relative to the baseline wage profile, $\ln \tilde{W}(t)$, and 0 in other periods, and b is the size of the shift. The $\alpha(t)$ function can capture a complete

shift in the profile or a one time jump. In the second elasticity, we are interested in the effects on hours of such shifts. Recall that we are in a world of perfect certainty, implying that what is captured in this elasticity is not a shift in the wage profile for a given person but the result of a comparison of hours responses for two otherwise identical people who face different wage profiles ($\ln W(t)$ and $\ln \tilde{W}(t)$, in this case). Then, the uncompensated elasticity of substitution can be written as:

$$\frac{\partial N(t)}{\partial b} = (\frac{1+\rho}{1+r})^t N_{1(t)} \frac{\partial \lambda_0}{\partial b} + N_2(t) \frac{\partial \ln W(t)}{\partial b} = (\frac{1+\rho}{1+r})^t N_1 \frac{\partial \lambda_0}{\partial b} + \delta \frac{\partial \ln W(t)}{\partial b} \tag{5}$$

The first term after the last equal sign is negative and captures the wealth effect: a wage increase in one period means the worker can afford to work less in all periods. The second term is the effect of current period wage change. Thus, writing out the model provides precise definitions of the elasticities and their relationship to each other. As we will see, it will also be helpful in discussions of the relevant identifying variation in estimation.

Two features of this model are worth highlighting because they are common elements of most THIRD Way papers. The first is that attention is focused on only one part of the economic problem - in this case, the hours of work, setting aside consumption. I will return to that point in the discussion of the approximation component. The second is that the utility function and, with it, the hours of work function is specified in as general a form as possible. The utility function is some function of consumption and leisure, presumably assumed to respect the basic requirements for utility functions, diminishing marginal utility. Similarly, the driving variables for the hours equation are specified but not the form of the hours function. Nonetheless, the function embodies useful information from the model. In this case, we know that the partial derivative of period t hours with respect to the period t wage, holding the other input to the hours function - λ_0 - constant equals the intertemporal elasticity of substitution. That fact will be used in the estimation. Thus, the hours function captures the core logic of the intertemporal choice model in a useful way. Or, to upt it another way, THIRD Way papers work with the minimal set of assumptions consistent with the model, avoiding unnecessary assumptions. In contrast, with a specific form for the utility and hours functions, we may not be sure the extent to which identification depends on the specific functional form - a common charge levelled against Structural papers. This is related to the point that THIRD Way papers are not trying to specify the whole model (which typically requires using specific functions).

Thus, choosing the economic model around which the paper is organized requires a balancing act. On one side, we want as general a model as possible so that our conclusions do not rest on a specific functional form. On the other, the model must have enough

content to guide our discussions of identification. Achieving generality - where the empirical specification we employ stems from the fundamental elements of the problem that agents are solving rather than the specifics of their utility or production functions - is a gold standard and not always easy to attain. In some cases, it is useful to specify something like a quadratic production function in order to get clarity on the implications of the economic problem - at least as a first step. For example, in the model of production and trade in Bertelme et al. (2025), preferences are kept in a general form through much of the derivation but their main dependent variable consists of differences in utility obtained from different goods and to make more concrete statements with the model they have to make specific assumptions about the form of the preferences.

Implementation: The step of choosing the right class of models is far from trivial. In some cases (such as in Beaudry and DiNardo (1995)), the question we are interested in is whether a certain class of models fits with the data, in which cases our theoretical starting point is clear. But in many, we are interested in an economic question, such as the impact of immigration on workers in a receiving economy, where there is a set of types of models to choose from. The answer to which to choose will lie, in part, in the data. Patterns of moments in the data will often point toward some class of models. As an example, in recent work with Mikal Skuterud and Stephen Tino, we have been investigating local labour market impacts of a surge in part time immigrant workers. In an initial reduced form analysis of impacts on other workers, we found a reduction in employment for workers under age 20 and over age 65 (groups who tend to work part time themselves). Our first thought was that this potentially fit with a model of firm level issues of substitutability among different types of workers. But further investigation indicated the job losses were mainly at firms that did not hire the students, pointing, instead, to general equilibrium models that emphasize competition among the firms.

So, then, which comes first - the data or the model? From my perspective, what comes first in THIRD Way papers is neither - what comes first is the question. The question will indicate broad sets of models that we would keep in mind at the outset - models of firm reactions in our case. Those models will guide the initial empirical investigations, e.g., choosing to work at the firm or the market level. The patterns emerging from those will point to some smaller subset of models, which would take us back to the data to see if some of the more obvious implications of those models are relevant, and so on, back and forth. Eventually, the researchers will choose a model and use it as the basis for the kinds of discussions that are central to establishing identification: what to control for; what is in the error term; the nature of endogeneity problems; and potential solutions for the problems.

The main criticism that would surely be levelled at THIRD Way papers by QExp researchers would be that we are relying heavily on an economic model that we know to be wrong. That the model is wrong could be a general statement about models of any kind - all models are restricted versions of reality that are wrong in some dimension. The answer to that, in part, comes from making the model as general as possible. It will still be an approximation to reality, but one in which the approximation imposes less on the estimation.

But even if we adopt quite general approaches, the models may also simply be wrong in their essence. Beaudry and DiNardo (1995) also examine hours and wages but use implicit contract theory as the basis of their investigations rather than an intertemporal choice model as in MaCurdy (1981). Their paper is also a very clear THIRD Way paper, using the theory to define what is being estimated (the response of hours to a wage change, holding productivity constant in an implicit contract setting) and what is in the error term. The result is a positive estimated effect of the wage on leisure in contrast to the negative intertemporal elasticity estimated in MaCurdy (1981). The two papers get to those different estimates even though they are both estimating regressions of changes in hours on changes in wages because they use different identifying variation as generated from their different controls and instruments. I view this is a clear example of the point that what we control for matters - in this case, it can switch the sign of a key coefficient. That both are carefully crafted investigations that provide transparent justification for their identification strategy highlights the value of working with theory. If we simply estimated regressions using vaguely justified combinations of controls and instruments, we would quickly conclude that we can get very different estimates of the impact of wage changes on hours of work by using different controls but without any basis for further discussion. Specifying and working with models, instead, provides the possibility of progress in our general quest to better understand the economy. Here, the logical next step would be to specify a more general model either to use it directly or use it as a basis for testing between the initial models.

One potential response to the challenge of relying too heavily on a model that could be wrong is to provide extra evidence in favour of the model in the form of tests of overidentifying restrictions. In Beaudry et al. (2012), we examine the impact of shifts in outside options on worker wages, framing the examination within a search and bargaining model. Within that model, if the mean rent embodied in the wages of other jobs a worker can access increases, then the worker's wage should increase. Mean rent could rise because of a shift in the industrial composition of jobs in the local economy toward high rent sectors or because of an increase in rent capture within those sectors (e.g., due to increased unionisation). Theoretically, the specific source of the increase is irrelevant in bargaining, implying an overidentification test of whether the two types of variation (which are not highly correlated in

the data) yield similar estimates of the outside option effect. The fact that they do provides support for the theory. One can then proceed to impose the restriction in the estimation to get efficiency gains. Not all theory will present an over-identification test of this type, but it is useful to look carefully to see if they do.

2.2 Approximation

The aim of the approximation component in THIRD Way papers is to generate an empirical specification that maintains the core logic, and with it the interpretability, of the model but does not include non-linearities that make it difficult to discern the nature of the identifying data variation. That is achieved through three, non-exclusive routes. The first is that, rather than estimating the deep structural parameters from a model, we estimate combinations of those parameters that are both interesting in themselves and are obtainable from linear specifications even when the model itself is highly non-linear. Elasticities of outcomes with respect to policy variables may have this form, for example. The key is that because we arrive at the parameters to be estimated either through taking a derivative of a general, interpretable function or through a direct derivation from a model, they provide both the interpretability and the resistance to the Lucas Critique that are key benefits from structural work but are estimated in a transparent way in terms of the data variation that is used. This is an approach that follows what Heckman and Urzua (2010) call 'Marschak's Maxim'.[1]

The second route is to carve out part of the model for estimation, leaving the rest of the model relatively unspecified. To the extent this can be done, we can allow for non-linearities in the non-estimated part of the model while working with linear forms for the estimated part. More specifically, THIRD Way papers tend to focus on one equation or, at least, one equation at a time. The alternative - estimating a simultaneous system of equations - would obscure the identifying variation and impose linearity throughout the model, making it more restrictive than an approach that linearises one equation but leaves the rest unspecified. Thus, focussing on one part of the complete model reduces the restrictions on estimation that are part of a fully structural approach.

The third route is to work with simplified functional forms in the empirical specification for the part of the model that we take to the data. These are often linear forms but, as we

[1] "Marschak's Maxim emphasizes that one should solve well-posed economic problems with minimal assumptions. Marschak noted that for many problems of policy analysis, it is not necessary to identify fully specified structural models with parameters that are invariant to classes of policy modifications ... . All that is required to conduct many policy analyses or to answer many well-posed economic questions are combinations of the structural parameters that are often much easier to identify than the individual parameters themselves."Heckman and Urzua (2010), p. 28

will see, don't have to be. We can arrive at the simplified specifications through different techniques. I will discuss those techniques as well as the second route for obtaining an empirical specification that has interpretability in terms of both theory and data variation in the implementation subsection below.

MaCurdy (1981) embodies all three of these routes to the approximation goal. His empirical specification is given by:

$$\ln N_i(t) = \beta_0 + \beta_1\theta_i + \beta_2 t + \beta_3 \ln W_i(t) + \epsilon_i(t) \tag{6}$$

That is, it is a linear regression of log hours worked on an intercept, a person specific effect, age, and the current period wage.

One way to get to this specification is to log linearize the hours equation, $N_i(t) = N((\frac{1+\rho}{1+r})^t\lambda_i, W_i(t), \gamma_i(t))$ (where I have altered the notation to explicitly recognize the presence of taste shifters, $\gamma_i(t)$):[2]

$$\ln N_i(t) \approx \ln N^* + N_1\frac{\lambda^*}{N}\ln\lambda_i + N_1\frac{1}{N}t\ln(\frac{1+\rho}{1+r}) + N_2\frac{W^*}{N}[\ln W_i(t) - \ln W^*] + N_3\frac{\gamma}{N}\ln\gamma_i(t) \tag{7}$$

$$= \beta_0 + \beta_1\ln\lambda_i + \beta_2 t + \beta_3\ln W_i(t) + \beta_4\ln\gamma_i(t) + \mu_i(t)$$

where, $\mu_i(t)$ is an approximation error that is a function of the right hand side variables and $\gamma_i(t)$. Getting to the estimating equation in this way provides interpretability. We know that, according to the theory, the person specific effect is the marginal utility of wealth at the outset of life and the content of the error term (preferences plus approximation error). We will see that knowing both of these is crucial for deciding on the nature of endogeneity problems and the potential solutions to those problems. We also know how to interpret the parameters. The coefficient on the wage, for example, is $\beta_3 = N_2\frac{W^*}{N}$, the intertemporal elasticity of substitution. This interpretability arises because the approximation involves taking the derivatives of a theoretically consistent function.

We can also get to the empirical specification by assuming specific forms for objective functions or other elements of the model that imply a linear form for the behavioural equation of interest. This is the approach that MaCurdy takes, assuming the utility function is:

$$U_i(c_i(t), N_i(t)) = \gamma_{1i}(t)C_i(t)^{\omega_1} - \gamma_{2i}(t)N_i(t)^{\omega_2}$$

where $\gamma_{1i}(t)$ and $\gamma_{2i}(t)$ are age specific modifiers capturing preference heterogeneity. From

[2]Where, I have assumed the expansion point is t^*=0, λ^*=1, W^* equals the overall average wage, and γ^*=1.

this utility function, the derived labour supply equation is:

$$\ln N_i(t) = \frac{1}{\omega_2 - 1}\{\ln \lambda_i - \ln \gamma_{2i}(t) - \ln \omega_2 + (\rho - r)t + \ln W_i(t)\} \tag{8}$$

or,

$$\ln N_i(t) = F_i + (\rho - r)t + \delta \ln W_i(t) + u_i(t) \tag{9}$$

where, we have assumed $\ln \gamma_{2i}(t) = \sigma_i + u_i(t)^*$, $\delta = \frac{1}{\omega_2 - 1}$, $u_i(t) = \delta u_i(t)^*$ and $F_i = \delta(\ln \lambda_i - \sigma_i - \ln \omega_2)$. Again, we have a specification in which we know the form of the controls (age and a person specific effect); the content of the person specific effect (mainly the marginal utility of wealth at the outset of life); and the content of the error term (preference shifters). We also, again, know how to interpret the parameters to be estimated. The coefficient on age is the difference between ρ and r. The coefficient on the wage is $\beta_3 = \delta = \frac{1}{\omega_2 - 1}$. Note that the coefficient on the wage is a function of the structural parameter, ω_2, rather than a structural parameter itself. That function is of direct policy interest and so there is no need to implement non-linear estimation to recover the structural parameter (though recovering ω_2 by dealing with the non-linearity is not difficult in this case). This is the first of the three approximation routes described earlier. MaCurdy also separates out the hours function from the rest of the individual's problem. Finally, he adopts a linear form for the part of the model he takes to data.

The difference between the two approaches to the final estimating equation is one of interpretation. Using the log linear route, the interpretation is as an approximation to a general function, but one that is only trustworthy for small changes in wages near the expansion point. I mean 'trustworthy' in two senses - in terms of estimation and in terms of prediction. In the estimation sense, the combination of the size of the wage changes used for identification and the extent of the non-linearity in the true function in the range where the wage variation occurs have to be such that the approximation bias in our estimates is small. In the example here, the approximation error, $\mu_i(t)$, in the error term in (7) will grow for larger changes in the wage relative to the expansion point, implying an omitted variables bias that means that the estimated coefficient on the log wage in a linear regression implementation of (7) could no longer be interpreted as a consistent estimator for the intertemporal elasticity of labour supply. In the second, predictive sense, even if the data variation is sufficiently small that we can view our estimates as having minimal bias in the region of our data variation, we can only use it to provide theoretically meaningful out of sample predictions of wage change effects if we restrict our attention to small wage changes.

The second interpretation of the log linear hours equation is that it is the correct speci-

fication arising from the specified utility function. That utility function is almost certainly not the true utility function and so it could be viewed as an approximation to the true utility function. The fact that we can integrate back from the empirical specification obtained from the log linear approximation to see what utility function it implies ties the two interpretations together. For the linear approximation to be trustworthy over an extended range of data variation, it must be the case that the related utility function approximates the true utility function well over that same range. In that sense, it doesn't matter which approach we take to get to the final form. It is useful, though, to see the form for the utility function (or of other elements of the model in other examples) implied by the final, approximated equation if we arrive at it through a log linearization. That will allow us to see what restrictions we are imposing on the theory in order to claim that the approximated equation is both consistent even when estimated with large data variation and that it can be used to predict effects from substantial changes in the driving forces. In some instances, these restrictions may appear reasonable and in others not. In the specific example of the MaCurdy paper, the answer to that question of reasonableness is mixed. MaCurdy shows that one could get to an equivalent specification (i.e., one with log of hours written as a log linear function of λ_i, $W_i(t)$, and an individual x time varying taste shifter) not just from the specific utility function he writes down but from a wider set of utility functions that includes Cobb-Douglas, addilog, and Stone-Geary preferences. However, the utility functions have to be either additively separable or log additively separable in consumption and leisure and that is an important restriction (Blundell and Walker (1986)). Knowing that then allows us to have a discussion about whether those separability properties are likely to hold, which is exactly where the discussion in the literature went in subsequent years.

A fully structural approach would adopt a utility function that could imply non-linear wage effects and estimate the parameters of that utility function. The treatment of those nonlinearities is one element that differentiates the structural approach from the THIRD Way approach. A structural approach treats them as being of signal importance and could, in some ways, be seen as a theoretical exercise in which we investigate whether and how those nonlinearities can generate different answers from what one would see from linear methods. The cost is that the nonlinearities make the identifying variation underlying the estimates opaque and raise the concern that the non-linearities rather than the data are determining the estimated values. The THIRD Way approach is the opposite. The very fact that we are linearizing means that we cannot be committing the sin of obtaining identification from non-linearities. Thus, it provides transparency on identification while still providing interpretable parameters but at the possible cost of the estimates of those parameters being biased if there are important nonlinearities present. I will return to the question of choosing between the

two approaches in Section x.

Implementation: It is natural when hearing the word approximation to think of linearization or log linearization. Indeed, these are the most common forms of approximation in THIRD Way papers. But it is useful to recall that the goal is to get to an empirical specification with which we can employ the insights on identifying data variation from the QExp literature and that does not always have to be linear. In the simplest case, the approximation may be linear in parameters but non-linear covariates may retain some of the effect of non-linearities in the theoretical model while still being examinable in terms of data variation. But, in addition, the approximated specifications can take the form of multinomial logits or other simple non-linear forms that - often because of control function arguments - can still be discussed in terms of identifying variation. Because respecting the theory is a key element of THIRD Way papers, it is natural that they would use estimators that fit with key elements of the theory such as the discrete nature of some of the dependent variables.

Because of these various possibilities for the approximation, a key implementation step is to decide on its exact form in the specific setting. The choices vary along three main dimensions: how much of the model to isolate for analysis and how to isolate it; at what stage to approximate; and the form of the approximation. I will talk about each of these elements in turn.

We have already encountered the point that THIRD Way papers typically examine some sub-component of a complete model. The choice of what sub-component will, of course, come from the question being addressed (e.g., how taxes affect labour supply). How much of the rest of the model needs to be specified depends on how convincing is the argument that one can isolate that sub-component without dealing with the rest of the model. The idea that one might want to carve out part of a complete model is a point discussed in some detail in Hamish Low and Costas Meghir's paper on the value and implementation of structural models.Low and Meghir (2017) They distinguish between Fully Specified Structural Models that 'allow a complete solution to the individuals optimization problem as a function of the current information set,' and Partially Specified Structural Models (PSSMs) that focus on 'one component of a fully specified model.' Low and Meghir argue that one can analyse part of a complete model while maintaining interpretability through some combination of two mechanisms. The first is the use of what they call 'sufficient statistics' - a variable that represents key elements in the rest of the model such that, conditional on that statistic, the other parameters in the simplified specification are interpretable within the theory (Blundell and MaCurdy (1999) use 'sufficient statistic' in the same way). The marginal utility of

wealth plays that role in the intertemporal labour supply problem.

The second route for obtaining consistency between the fully and partially specified models is through assumptions about separability in the objective functions in the full model. As we have seen, MaCurdy's log linear form for the hours supply equation (in which the consumption part of the consumer's problem is not directly present) is based on an assumption of additive separability of hours and consumption in the per period utility function. The idea that a single equation from a complete model can be interpretable in isolation points to a separability somewhere in the system makes intuitive sense. It is not always necessary, though. One advantage of the two-stage budgeting approach to intertemporal labour supply is that it does not require a separability assumption for the per period utility function.(Blundell and Walker (1986), Blundell and MaCurdy (1999)) Instead, it involves the inclusion of a sufficient statistic that is endogneous and, so, requires finding a valid instrument. Other restrictions on theory, such as linearity in the production function assumed in Bertelme et al. (2025), can also serve to carve out part of the economic problem and reduce the data requirements for implementation.

THIRD Way papers share the focus on part of the overall model with PSSMs. As in Low and Meghir (2017)'s discussion, they carve out that part of the full model using one or both of a sufficient statistic and/or a separability assumption. The idea of using separability in the objective function goes back to our discussion of how to interpret the approximated form for the equation of interest. If we view this only as a local approximation then separability assumptions are not required. If, instead, we want to extrapolate the results to a broad range of data then something like a separability assumption may be implied.

The THIRD Way approach will typically differ from PSSMs because of the approximation step. As Low and Meghir describe PSSMs, they may be implemented using structural estimation approaches that embody the non-linearities in the model. This is the sense in which this argument about carving out part of the model through assumed separability restrictions is different from the restrictions implied by linearising discussed above. At times, though, PSSMs and even fully specified models will be implemented with linearizations of parts of the model in order to clarify identification - a THIRD Way paper embedded in a PSSM. Attanasio et al. (2018)'s estimation of a log wage equation interpreted as capturing parameters in the marginal rate of substitution is an example of a careful QExp type discussion of the identification of a linear model as part of a larger structural exercise.

The second approximation choice is the stage at which to carry out the approximation. If we think of economic models as constrained optimization exercises, then there are three different points at which approximation might occur. The first is to approximate the ob-

jective function and/or the constraint. This is the approach taken in the 'linear-quadratic' approximation approach in macro. If the utility function, for example, is quadratic and the constraint is linear then the solution will naturally take a linear form.(McGrattan (1990)) The second is to linearize or otherwise approximate the first order conditions so that the system of first order conditions has a closed linear, form. The third is to approximate the final behavioural function, such as the labour demand function. If all other parts of the problem have been left in general form, then the system of first order conditions from which the behavioural function has been derived may only define that function implicitly. This was the case in the MaCurdy intertemporal labour supply example.[3]

While all three of these lead to a final linear form, they are not necessarily equivalent since they can include different terms. Kenneth Judd, in his discussion of approximation methods in macroeconomics describes a growth model in which the linear-quadratic approximation would miss some second order terms that would be included if the approximation was done at the last stage.[4] If higher order terms capture something essential about the economic problem under investigation - as they do in Judd's example - then the approximation should be done at the third stage.

In other cases, though, it is better to implement the approximation in the core elements of the model. An important example of this is found in situations involving discrete choice. Ashworth et al. (2018) implement a model of schooling, experience, and wages in which individuals choose their level of schooling and whether to work while in school. Their approximation consists of the combination of assuming a linear form for the indirect utility function and assuming that individuals have idiosyncratic preferences for the different states drawn from a Type I EV distribution. This, of course, leads to a multinomial logit (MNL) form for the estimator. The difference in how Structural and THIRD Way papers would proceed at this point comes down to interpretation. Structural papers would interpret estimated coefficients as estimates of parameters of a utility function while THIRD Way papers will treat them as the basis for predicting the effect of a change in a covariate on the probability of a given outcome without relating that directly to the deep parameters in the model.

The inherent non-linearity of MNL or other discrete choice estimators may seem troubling to QExp researchers but we can have QExp type discussions of this empirical specification. For example, if we decide (based on the theory) that a covariate is endogenous, we can address that endogeneity through a control function approach in which the first stage is a

[3]The implicit function theorem, itself, is about that function existing in a local area, i.e., it has some of the same features as the approximation.(Judd (1996))

[4]Second order terms arise in this problem because the behavioural equation comes from the solution of a first order differential equation.

linear regression. It is, of course, true that maximum likelihood estimators of discrete choice models impose specific non-linearities, such as those associated with the normal density in a Probit estimator. The MNL, in addtion, imposes the independence of irrelevant alternatives. These, though are not substantially different in nature from the assumption of additive separability implicit in the linearized hours function in the intertemporal labour supply problem.

The QExp alternative for working with discrete dependent variables is to use a linear probability model. This is equivalent in the THIRD Way approach to doing the approximation at the last stage. As is well known, linearity is a reasonable approximation to the CDF's that underlie maximum likelihood function estimation for the same problems in the middle of the distribution, but a bad assumption for the tails. Thus, whether one wants to do the approximation in the main part of the theory as in Ashworth et al. (2018) or at the end by using linear probability models will depend on where the main variation is in the data and whether we want to predict effects for changes in covariates that would be large enough to imply probabilities in the tails of the distribution. The key point, though, is that approximation in THIRD Way papers does not have to imply linearization of the final behavioural function - just as little non-linearity as we can get away with while still respecting the theory and the nature of the data.

The third decision is the form of the approximation. This is connected to the decision on the stage at which the approximation is done. If the approximation is of the objective function then a linear approximation is typically not what is called for because taking derivatives of the linear function will mean losing the arguments of the objective function as we move to the first order conditions. In the linear-quadratic macro literature, for example, the objective function is assumed to be quadratic. And, as we just saw, in discrete choice problems, the approximation may involve an assumption of a specific distribution for unobservables.

When the approximation is of the final, behavioural function, the most commonly used approximations are first order linear or log-linear Taylor approximations. Log linear approximations are common in macro because of their relationship to growth relationships. For micro applications, the log linear approximation results in the estimated coefficients being elasticities, but, more importantly, interpretable elasticities. The Taylor expansion of a theoretically defined behavioural function involves derivatives of that function, which often have a directly useful interpretation. For example, in the intertemporal labour supply example, the coefficient on the log wage term in the log linear approximation is $N_2\frac{W^*}{N}$, where N_2 is the partial derivative of the hours function with respect to the wage holding λ constant, and so, this is the intertemporal elasticity of labour supply. We could think, instead, of

deriving the labour supply function in general form (as in equation (4)) and then moving to a flexible function of the right hand side variables in the estimating equation. Such an approximation would fit the data better, but in cases where we are interested in estimating specific parameters related to theory, the coefficients in the function would be difficult to relate back to the theory. In contrast, when our interest is in estimating a function (as it is in the economies of scale function in Bertelme et al. (2025)), the flexible functional form approximation approach is superior.

It is important to point out that linear approximations do not have to mean that the terms in the function being linearized correspond to first moments. In an example where risk aversion is important, for example, the behavioural equation might naturally include terms in the variance, skewness, etc. of the distribution function for income. In that case, linearization of the behavioural function will result in an empirical specification that includes those terms. This would not be the case if the utility function were linearized, eliminating risk aversion as an element of individual preferences.

The fact that the linearizations, when they are used, are typically first order likely relates to ease of interpretation. But what a higher order approximation gives up in interpetability may be offset by the fact that it will capture the curvature of the function of interest near the expansion point. Using that curvature, we can argue that our estimated effects are valid for bigger differences in the covariates. As anyone who has worked with non-linear terms knows, though, the exercise of including higher order terms often sounds simpler than the reality. The derivation and running of the resulting regression are not difficult but there are often collinearity problems that mean that all the estimated coefficients - on the linear and non-linear terms - are not very robust. That means the estimated coefficients could imply very different elasticities from what is obtained from the linear approximation but, with large standard errors, we are unsure which set of estimates to trust. In that case, the best we can do is likely to stay with the linear approximation because those estimates are more stable and the linear approximation is still a valid approximation in a small range around the expansion point. As a result, we would have to restrict our interpretation to the effects of small changes in the covariates. Of course, if the estimated coefficients on the non-linear terms are well defined zeros - taking economically insubstantial values with relatively small standard errors - then we could work with the linear approximation in examining the effects of larger covariate changes with some confidence.

2.3 Empirical Specification and Identifying Variation

After the approximation is obtained, we arrive at an estimating equation that looks much like one we would implement in a QExp paper. Indeed, the point of the approximation was to get to an empirical specification to which we can apply the arguments and insights from the QEexp literature. All of the discussions from that literature about identification - weak instrument tests, determining the identifying data variation, standard error corrections for various problems, deciding on whether what is being identified is for a marginal group, etc. - all hold here. I have nothing to add to that literature about these issues but that does not at all indicate that they lack importance. Discussions in this part of a THIRD Way paper should be careful and exhaustive about these issues in the same way that QE papers are.

What differentiates a THIRD Way paper from a QExp paper is the central role that theory occupies in the determination of the details of the empirical specification. In particular, the theory is used to determine the nature of identification challenges, to suggest potential solutions to the identification challenges, to provide a basis for interpretation of what is being estimated, to allow us to go beyond simple causal effects, and to provide guidance on included controls, which help determine the data variation used to identify key parameters. I will talk about each of these elements in turn.

What the Error Term Contains We can see the importance of determining what is in the error term and the role of theory in that determination by returning to the MaCurdy example. In equation (9), we can see that if we were to regress the log of hours of work for a person on their age and their wage then the error term would include F_i. But the theory shows that the key component of F_i, λ_i, is a function of all the elements of a person's life cycle problem, including $W_i(t)$, implying a clear endogeneity problem. In such a regression, the coefficient on the log wage would not identify the inter-temporal elasticity of labour supply, δ, because it would be partly capturing λ_i. More generally, endogeneity concerns are defined by the relationship between the error term and the covariates. Because the error term is, by definition, unobservable, we need some basis outside the data for discussing its content and relationship to the covariates. Theory provides a commonly accepted venue for those discussions. Moreover, appealing to a specific theory to justify our assumptions about the content of the error term results in greater transparency about those assumptions. The alternative - vague references to common sense - reduces our ability to use logic and rational argument to defend our assumptions and the responses to endogeneity embedded in our estimator.

Implications for Identification Strategies Knowing the content of the error term helps both to define the nature of identification challenges and to point to potential solu-

tions to those challenges. In the MaCurdy example, the natural response is to control for individual fixed effects in our estimator. That is, the model makes clear both the nature of the endogeneity problem we face and that we need to use within-person over-time variation to identify δ.

On one level, this response may seem obvious. Proponents of the QExp approach might argue that of course we are going to include individual fixed effects to soak up a multitude of sins and that there is no need to work through the theory to get to that point. But the theory does more than point to an estimator. It also clarifies the assumptions needed for that estimator to provide identification: in this case, that what is left in the error term (preference shocks) must be independent of changes in wages. We can specify this, and have a discussion of its reasonableness, because we know from theory what is in the error term. Knowing what is in the error term also has implications for the estimators we can use. If we only had cross-section data, we might be tempted to look for an instrument for $W_i(t)$. But the error term contains λ_i, which is a function of $W_i(t)$, making finding an instrument very difficult. We would have to find an instrument identifying idiosyncratic variation in the wage in a given year, but without panel data such an instrument would be nearly impossible to find and, if found, to establish its plausibility. Put another way, it matters not just that there is a person specific effect but the specific content of that effect.

We can see the same lesson in other THIRD Way papers. For example, the estimating equation in Bertelme et al. (2025) has, as its dependent variable, the share of expenditures on good k produced in country i in all other, importing countries and as its key covariate, the number of employees in industry k in country i. The latter variable captures economies of scale effects on productivity and is the key point of interest in their investigation. Their derivation shows that the error term in their linear regression consists of other, unobserved elements of productivity and can be shown to be related to industry size in the model. That means for identification they need variation in industry size that is independent of productivity shocks. They get that by appealing to the model and showing that variation in expenditure shares by consumers in the producing country, i, reflects preferences that help determine industry size independent of its productivity. They construct an instrument based on this argument using expenditure shares of country i consumers on goods produced in other countries. Having specified the instrument, the authors provide a QExp style discussion of the source of its identifying variation. Specifically, the instrument gets its variation from movements in the total size of the country and shifts in tastes, as captured in the expenditure shares. What denotes this as a THIRD Way paper is that the authors defend the validity of that variation with direct reference to the theory and, more particularly, what is in the error term. Thus, they state that the shifting expenditure share variation is valid as long

as increases in the productivity associated with a good in country i does not lead to people shifting their preferences toward that good.

These examples point to a key general lesson: theory is useful for describing what is in the error term, and what is in the error term matters - a lot. It determines the nature of any endogeneity problems and what estimators we should be using to try to address them.

Interpretation of Estimates The third advantage of arriving at our estimating equation through theory is that it provides clarity on what we are estimating. In the MaCurdy example, we learn that in a world of perfect certainty, what we are estimating with the difference estimator is the response of an individual to known changes in the wage. That is, this cannot be used to ask what will happen if, for example, a new tax policy change altered wages at some point. To do that, we need cross-person variation but, as the theory makes clear, an estimator such as a cross-sectional estimator that uses cross-person variation in simple ways does not provide consistent estimates for anything of interest. Of course, the response might be that a world of perfect certainty is unrealistic and that once we include uncertainty, the specification and the lessons could change. But the key point is that we are now talking about economics when we talk about the fixed effects, etc.. And that is the THIRD Way approach - doing empirical work at the intersection of theory, concern about data variation, and concern about whether the estimator is imposing the answer.

Expanding What We Investigate Theory also provides us with the possibility of expanding the set of economic objects we can estimate beyond what is possible with the simplest data variation. In the MaCurdy example, this includes the uncompensated elasticity of substitution - an object of central interest in policy evaluation. As equation (5) shows, getting a consistent estimate of the intertemporal elasticity of substitution, δ - which we saw is obtainable from a simple differenced estimator - is part of that, but we also need an estimate of the impact of a wage change on the marginal utility of wealth ($\frac{\partial \lambda_i}{\partial b}$). Because the marginal utility of wealth incorporates everything about a person's lifetime problem, there is almost by definition no such thing as a way to estimate this derivative in a classic QExp approach in which we only use difference in difference style variation within a sample range. To get this crucial policy parameter, we need to make some further assumptions and the theory provides the necessary guidance to do that.

MaCurdy's approach is to start from an equation determining the individual fixed effects that include λ_i:

$$F_i = z_i\phi + \sum\nolimits_{t=0}^{T} \gamma(t) \ln W_i(t) + \theta A_i(0) + a_i \tag{10}$$

where, z_i and a_i are observed and unobserved characteristics that drive preferences, respectively. The goal is to obtain estimates of the $\gamma(t)$ parameters. The approach to getting them

once again involves a linearization (in this case, of (2) in which λ_i is implicitly defined). The theory tells us that we need the life cycle profiles of wages and the starting value for assets, $A_i(0)$. MaCurdy summarizes the wage profiles with person-specific heights, slopes, and curvatures for the individual profiles during the sample range and substitutes them for the wage profile in (10). He next forms estimates of the individual effects, $\hat{F}_i$, using the estimated parameters from the initial, differenced regression and then regresses those effects on the wage profile summary measures and the other covariates, instrumenting for the wage profile elements with time invariant characteristics (own and parental education).

Once again, what this approach gives us is estimates of theoretically meaningful parameters generated in a way that provides transparency on the assumptions needed to get them and on the identifying data variation. We need an assumption, for instance, that the 10 years of data in the sample frame allow us to identify parameters of a quadratic wage-age profile that also determine the wage profile outside the sample frame. Knowing this, we can determine what data variation is identifying the key parameters. For example, the parameter on the wage slope variable is identified by the extent of the correlation between $\hat{F}_i$ (which takes high values for people who have higher average hours of work over time than one would predict based on their average wage) and the person's wage profile slope. This seems like credible variation for identifying the extent to which this element of the wage profile determines the marginal utility of wealth. My focus, though, is not on whether MaCurdy's approach is actually convincing but on the point that using theory in this way tells us what we need to measure (the wage profiles) and that the linearized form provides an estimation approach that permits a discussion of the identifying variation for the theoretically interpretable parameters being estimated. It allows us to go beyond what is directly estimable from difference in difference type estimators.

In other instances, theory can help fill gaps due to lack of observability of key elements of a model. In Beaudry and DiNardo (1995), the authors need to control for the productivity of a worker-firm match in order to isolate implicit contracting effects, but they don't observe productivity directly in their data. They respond with an instrumenting strategy based in the model in which they use time of job entry by current time effects to isolate insurance components of wage variation. In Bertelme et al. (2025), their theoretical derivation reveals that the dependent variable they are interested in is relative preferences for goods produced in different countries. In response, the authors turn to a theoretical result from the trade literature which says that if the utilities take a nested logit form then we obtain a gravity equation specification in which the averaged log utilities are replaced with expenditure shares. In both cases, the theory takes us to approaches and measures that one might not arrive at without appealing to the theory. And in both cases, the appeal to theory means that readers

know exactly what assumptions are being employed and can debate them.

Determining Controls Finally, the theory provides a basis for deciding on what controls to include, which is crucial for determining identifying variation for the main parameters of interest. This is a point made effectively in Blundell and MaCurdy (1999)'s examination of the estimation of the intertemporal elasticity of labour supply using cross-sectional data and I repeat their argument here.

To begin, returning to the MaCurdy example, he writes a person's life cycle wage path as a quadratic in age, with the coefficients in the quadratic written as linear functions of exogenous, non-time varying characteristics such as parental education. Plugging this into (10) and that into (9) and then rearranging terms, we obtain a reduced form type specification:

$$\ln N_i(t) = Z_i\psi + tb + \delta \ln W_i(t) + (u_i(t) + a_i) \tag{11}$$

where, Z_i is a vector of all the person-specific, time invariant observed characteristics that determine λ_i.

At this point, Blundell and MaCurdy (1999) consider two wage regressions. The first is:

$$\ln N_i(t) = Z_i d_0 + d_1 t + d_2 \ln W_i(t) + e_i(t) \tag{12}$$

We are interested in the interpretation of an estimate of d_2. For simplicity, I will assume that $u_i(t)$ and a_i are independent of all the right hand side variables. Under a standard Frisch-Waugh argument, we can obtain an estimate of d_2 by first regressing $\ln W_i(t)$ on Z_i and age (t) and then regressing $\ln N_i(t)$ on the residuals from that log wage equation. This implies that the variation in log wages that identifies d_2 comes from the non-linear part of its variation with age. Intuitively, by controlling for Z_i, we are examining how hours of work move with age for people with the same value of λ_i but who are at different places on the wage profile. That is, we are identifying the intertemporal elasticity of labour supply, δ.

The second hours regression is given by,

$$\ln N_i(t) = f_0 + f_1 t + f_2 t^2 + f_3 Y_i(t) + f_4 \ln W_i(t) + \tilde{e}_i(t) \tag{13}$$

which is a specification derived from a two-stage budgeting approach to the life cycle labour supply problem, and $Y_i(t)$ is a consumption based income measure indicated in that theoretical approach. With this specification, the identifying variation determining the estimate of f_4 is across people with different values of variables that determine λ_i but, given the controls for age and age squared, at the same point on the wage-age profile. Thus, this specification identifies the uncompensated elasticity of substitution.

The key point from this discussion is that the interpretation of the coefficient on our main variable of interest, $\ln W_i(t)$, changes substantially depending on what other variables we control for. This means that researchers need to account for all of the controls that they include in a specification. Accounting for them convincingly means that they need to defend their set of controls according to some commonly accepted standard. Economic theory provides such a standard - a common framework within which we can have debates that are consistent and logical.

Imagine, instead, that we approach the estimation of the elasticity of hours of work with respect to wages using cross-sectional data without any direct theoretical specification. We might argue that we all know what such an elasticity means and don't need to re-write well known theory to estimate it. But how, in that case, would we begin to understand the variations in the estimated value of that elasticity that we would get if we alter the set of other controls? Without a standard for debate about which estimates are credible, we run the risk of researchers choosing the one they most prefer without having to provide a coherent defence for why they made that choice. And notice that pure statistical arguments will not provide an answer here. Including all the variables in Z_i plus $Y_i(t)$ and a polynomial in t will undoubtedly generate a higher R^2 than either of the two specifications listed above but the resulting estimates do not have a consistent interpretation. Thus, a key lesson is that what we control for matters – a lot. And that implies a clear role for economic theory in empirical work in deciding what controls to include.

That what we control for matters is not a new point. Indeed, examined through the lens of the Frisch-Waugh theorem, it is the whole point of the credibility revolution - that what data variation we use matters. In the difference-in-difference type specifications that have become the focus of QE research, this is recognizable as the requirement to account for which sets of fixed effects to include. But the argument extends to all controls in a specification. And, to repeat, economic theory provides the logically consistent framework within which we can debate what controls to include. Bertelme et al. (2025), for example, provides a direct account for the fixed effects they employ written in terms of the deep parameters of their model. The implication is that truly committing to the message of the credibility revolution means committing to using economic theory. MaCurdy's seminal paper pointed out the need to take data variation seriously at least a decade before the onset of the credibility revolution and also pointed out its implications for the need for careful use of theory in empirical work. His THIRD Way implementation allows for both.

3 When to Choose the THIRD Way Approach

Attempts to estimate objects of economic interest involve some combination of two types of information: information from variation found in data; and information from the logic of economic models. Whether the resulting statistics provide useful estimates of objects of interest depends on the perceived credibility of the information being used in relation to those objects. QExp researchers view credibility as entirely situated in the data variation. The imposition of information from a model, to them, can only obscure that data variation and reduce the credibility of estimates. Structural researchers, in contrast, view estimates constructed without reference to theory as largely uninterpretable and, in that sense, not credible. They use both types of information but place strong emphasis on the information contributed by the model. THIRD Way papers strike a different balance. They also work with the information found in theory but in a way that makes the data variation information easier to see and assess. A compromise of this type, of course, is bound to make the researchers wedded to both the other approaches unhappy.

Are there situations when the balance struck in THIRD Way papers is either more or less preferable? The fact that THIRD Way papers adopt a specific theoretical lens - even if they don't impose the non-linearities from a specific functional forms - narrows the researcher's perspective when working with the data to some extent. There is generally a first, investigative stage when all possible data moments are being examined but once a particular theoretical lens is adopted, some of those will be dropped. For example, as we have seen, the theory in a THIRD Way paper will imply restrictions on the set of controls to be included in a regression. This restricted perspective can prevent us from seeing new relationships that can alter how we see both theory and policy impacts. Thus, a purer QExp approach is more valuable in initial, data explorations which are the equivalents, in paper form, of the investigative first step in THIRD Way papers. One can also make the case for QExp approaches in pure programme evaluation exercises, though statements about the external validity of the resulting estimates requires some appeal to theory. But whenever we move beyond the first stage data investigations, I would argue that the advantages of having a basis for making arguments about controls and the nature of and solutions for identification challenges point toward a THIRD Way approach. Moreover, grounding an investigation in theory could replace pre-analysis registration of plans. Those plans are intended to tie the hands of the researchers to prevent data mining but their basis can be arbitrary. With theory, a researcher would limit their investigations to combinations of controls and methods that are consistent with the theory.

Deciding when to use THIRD Way versus Structural approaches is more nuanced because

the line between the two can be somewhat murky. From the discussion in Section 2.2, THIRD Way papers are differentiated from full Structural papers in two ways. First, THIRD Way papers examine only part of the complete model. They do this, as Low and Meghir (2017) point out, by employing sufficient statistics that represent the rest of the model and/or through separability assumptions. Whether this provides credible estimates depends on the nature of the object of interest, the nature of the available data variation, and the nature of the economic model. If we are interested in complete welfare calculations for all economic agents then a full model will be favoured over a partial model. On the other hand, if our focus is on, say, the welfare of workers then a partial approach could still be useful.

Regardless of the object of interest, a partial specification will not generate credible results if the separability or other simplifications inherent in it obscure or eliminate key relationships for the object of interest. Treating occupational choice as separable from choice of education level, for example, may be seen as defining the problem too narrowly to provide credible answers. Alternatively, if the partial model is specified using a sufficient statistic; if (as is generally the case) that statistic is endogenous; and if there is no variable that could plausibly form an instrument for the statistic in the data, then here, too, the partial approach will not produce credible results. Either situation would point toward using a full Structural approach, while acknowledging that is the specific form of theory that is driving identification.

THIRD Way papers are also different from what Low and Meghir (2017) call PSSM because of the use of approximations. As I discussed in Section 2.2, whether we obtain credible estimates from that approximation depends on the combination of the theory, the data variation, and the object of interest. If we are interested in an elasticity at specific point, for example, then a log linear approximation can deliver that without any restriction on the theory. Similarly, if the identifying variation in the data is small then we may get relatively unbiased estimates from a linear specification, but extrapolations to the effects of larger changes may not be trustworthy. If the data variation is substantial then we need that the underlying model fits with the linear estimating function. If none of these is true then a structural model that incorporates the key nonlinearities may be preferable. But it is worth keeping in mind that the specific functions used in a structural model are themselves approximations so there is a trade-off between assuming that specific form and having it determine results versus using a linear form that could approximate a more general function but is lacking the nonlinearity.

We can approach the problem of the importance of the non-linearities empirically, of course, by implementing a higher order approximation to the general function and testing

the higher order terms. As I said earlier, though, collinearity will tend to imply that those tests have low power. If they aren't conclusive then we revert to a discussion about the importance of non-linearities in the specific environment. There are cases where it seems, at at least at first glance, clear that they belong in Structural camp. One possible example is found in insurance markets where issues of attitudes toward risk and the importance of higher moments in income distributions point to the centrality of non-linearities. As I discussed in Section 2.2, though, one might still be able to take a THIRD Way approach by carrying out an approximation at a later stage and arriving at an estimating equation that includes the variance, skewness, etc. of the income distribution.

Underlying all of this is the question of whether the goal is to just estimate a single parameter, like an elasticity, or to generate counterfactuals. Structural models are typically built in order to examine counterfactuals. If the answers to the questions set out above indicate that a THIRD Way approach will provide credible answers in the specific economic environment then the estimates are presumably useful to generate credible counterfactuals - though only for the part of the model that is being directly examined.

Before getting carried away, though, it is important to point out that economic theory will not magically provide all the answers - especially if we use it in the THIRD Way approach in which we do not employ specific functional forms for the core structural elements such as utility functions as is done in structural estimation. It rarely provides us with specifics on the functional form in which a variable enters - in logs, as a quadratic form, etc. - and is often insightful on classes of variables we need as controls but not on which specific variables. In the labour supply case, for example, we know that we need the time invariant determinants of life cycle conditions, Z_i, in some specifications but the theory doesn't tell us exactly what should go in Z_i. Instead, it provides us a basis for discussing what plausibly belongs in that vector among the variables in our dataset and a rationale for trying to obtain new measures that provide a better representation of what the theory says we need. It provides a basis for debate not finality. To have those debates based on vague references to common sense or intuitive directions for effects risks generating specifications that are both internally and externally inconsistent.

4 The 'Sufficient Statistics' Literature

For many readers, the THIRD Way approach of starting from theory and moving to the implementation of a simple empirical specification will bring to mind the Sufficient Statistics

literature.[5] The Sufficient Statistics literature aims at measuring the welfare effects of a policy change using a set of estimable elasticities rather than estimating the deep structural parameters that characterize utility or production functions. Those elasticities can be estimated using QExp type methods. Thus, as with the THIRD Way approach, the point is to combine interpretability from structural approaches with the clarity on identifying data variation from the QExp approach. In the Sufficient Statistics literature this is achieved by assuming that the economy is operating efficiently. Researchers then invoke the envelope theorem, implying that behavioural responses in a manner that would shift the elasticities they focus on are essentially zero and can be ignored (an approach that is similar to MaCurdy's assumption that individuals are optimizing and the rest of their problem can be controlled for using λ_o). As in the THIRD Way literature, if the necessary assumption related to the approximation - in this case that the observed changes are small enough to make the use of the envelope theorem reasonable - is unreasonable then moving to a full Structural model would be indicated.

But the two approaches differ in two key ways. The first is found in the use of theory in establishing what is to be estimated. As Klevin (2021) shows, if the problem of the welfare effects of a policy change is formulated with fully general utility and tax policy functions and multiple goods then the effect of the policy change can be written as a function of all own and cross price elasticities and income elasticities for the goods. This, however, is is too big a set of elasticities to actually estimate. As a result, studies restrict either or both of the functional form for the utility function (e.g., using quasi-linear utility in income is common) or the form of the effects of reforms on taxes (e.g., there is one common tax effect on all prices). That is, the Sufficient Statistics approach still imposes functional form restrictions that have the potential to determine conclusions, making it closer to full structural approaches than the THIRD Way.

The second difference is in the way theory is used in the empirical specification and implementation stage. As we have seen, in the THIRD Way, theory is used heavily to determine the set of controls and the empirical approach (which instruments are valid, etc.). In contrast, in the Sufficient Statistics approach, the theory is not used at all in the estimation step. That is implemented as a standard QExp approach. Thus, theory is both more present (in the sense of imposing specific functional forms to get interpretation) and less present (in that it is not used to guide the empirical work) in the Sufficient Statistics approach.

[5]Note that this is a different use of the term 'sufficient statistics' than that used in Blundell and MaCurdy (1999) and Low and Meghir (2017).

5 Conclusion

I have argued that there is a THIRD Way of approaching estimation in empirical micro economics (the THeory Induced Research Design way) that differs from both full structural approaches and quasi-experimental, reduced form approaches. Even though it not typically named, it is an approach that has been used widely - ranging from some of the oldest, seminal papers in empirical labour to forthcoming papers in the area of industrial policy.

THIRD Way papers have three main components. The first is an economic model that, as in Structural papers, is central to the analysis. The model is typically chosen after an examination of the data but it is not an afterthought to the main empirical analysis in the paper - it is an integral part of it. The model is typically written in as general a form as possible in order to emphasize that its guidance stems from its core logic not from a specific functional form assumption. Some THIRD Way papers use specific objective or other functions in order to ease the exposition. In those cases, it would be useful for them to also present a more general form of the model so that readers can tell whether their empirical specifications are mainly reflecting the core logic of the model or the specific functional form. The analysis also typically deals with only part of the model, leaving other parts of the overall equilibrium loosely specified.

The second component is an approximation. This forms the bridge between the theory and an empirical specification that is simple enough to allow transparent discussions of what data variation is identifying what parameters. This is typically a linear or log linear approximation of a behavioural function but, as I pointed out, the stage at which the approximation is carried out and the nature of the approximation can vary. One useful point for discussion among THIRD Way researchers would be about which types of approximation approaches work best in which economic environments. The specific approximation implies restrictions on the empirical model that would have to hold in order for the estimated coefficients to maintain interpretability. It would be useful for all researchers to integrate back from their empirical specification to show readers exactly what those restrictions are in order to allow for an assessment of whether they are too severe for the question at hand. It would also be useful for all researchers to implement second order approximations as a check, at least, on whether the linear form appears to represent the data reasonably well.

The third component is the determination of the empirical specification. This involves deciding what controls to include, what is in the error term, and, from the latter, the nature of and solutions for identification problems. Many of the implementation issues are the same as in QExp papers and, in fact, the approximation step is carried out in order to allow

researchers to utilize the insights from the QExp literature. But THIRD Way papers differ from QExp papers in that the theory is used explicitly to answer each of the specification questions. This represents an attempt to bring together the best elements of the Structural and QExp approaches. It is a way of getting external validity without making the same range of assumptions as is needed in a full structural approach. The THIRD Way approach takes seriously the command from the QExp literature to justify the data variation used for identification but it finds that justification in economic theory and, like Structural papers, is precise about what is being estimated.

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