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Fiscal policy: post- or New Keynesian?*

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This paper asks whether the post-Keynesian or New Keynesian paradigm provides a more realistic description of the effects of fiscal policy on output and consumption. I establish some macro and microeconomic stylized facts on fiscal multipliers and marginal propensities to consume based on the extensive empirical literature. I compare them to basic and extended modelling approaches within the two traditions. The picture is mixed and points to shortcomings in both paradigms. I outline the elements they could learn from each other as well as from some other strands in the literature to create a coherent and convincing Keynesian macro-micro framework of fiscal policy modelling.

Keywords: *macroeconomics, fiscal policy, history of economic thought, multiplier, marginal propensity to consume*

JEL codes: *D10, E20, E60, H30*

1 INTRODUCTION

How and to what extent fiscal policy affects output is a classic and recurring question in macroeconomics. The fiscal multiplier – the measure of how much GDP is created by an additional dollar spent by the government – has always been a central figure to policymakers. This is particularly so during severe downturns, like the Great Recession and the subsequent euro area crisis, as well as the COVID-19 crisis. When it comes to explaining the mechanisms of the multiplier effect, an important element is the marginal propensity to consume (MPC) – the measure of how many extra dollars a household spends within a certain time horizon (for example, one year) after receiving an extra dollar of unexpected income¹ – related to an increase in government spending, transfers, or tax cuts. The multiplier and the MPC have occupied the minds of (among others) Quesnay, Keynes, Kahn, Haavelmo, Samuelson, Friedman, Moore as well as contemporary scholars of various schools of thought, who have described different channels at work.² Today, the most comprehensive (and at the same

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1. Note that more precisely I should speak of the marginal propensity to spend, since consumption of durable goods and the respective flow of welfare is spread over a longer time span after the moment of purchase. The latter is decisive for my focus on the macroeconomic effects of fiscal policy. Nevertheless, the term MPC is so common that I stick to it.

2. Hegeland (1966) provides a detailed early history of the multiplier, while Gechert (2017) briefly discusses the more recent history.

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time distinct) macroeconomic frameworks that concern the workings of fiscal policies are those of the New Keynesian (NK henceforth) and post-Keynesian (PK henceforth) paradigms. The main distinction between these two approaches is that PK models focus on macroeconomic relations and are primarily driven by aggregate demand both in the short and long run, while NK models are derived from neoclassical microeconomic utility optimization principles and feature a strong role of aggregate supply, complemented by short-run aggregate demand constraints.

This paper asks, which of these paradigms provides a more realistic description of the effects of fiscal policy on output and consumption. To this end, I describe the basic channels at work in respective basic models – a simple PK supermultiplier model as discussed, for example, in Palley (2019) and an analytic description of a NK DSGE model as in Woodford (2011). I then compare them to the empirical stylized facts, both from the macroeconomic and microeconomic literature. The model selection is necessarily arbitrary, given the rich literature in both paradigms, as outlined for example in Hein (2017) and Reis (2018). However, the chosen models are useful because they focus on fiscal policy and represent the PK and NK approaches as simple as possible. Since these pedagogic models lack some realistic features, I refer to extensions that have become a quasi-standard in the respective literatures, if necessary. By this, I intend to strike a balance between a simple analytical description of the paradigmatic differences, an exposition of developments in the NK and PK approaches to fiscal policy, and a clear judgment on their empirical performance.

It turns out that both the PK and the NK approaches can explain only some of the multiplier and MPC facts and that the overlap is astonishingly narrow. NK models underestimate the size of the government spending multiplier and the average MPC during times of normal capacity utilization. They do not provide convincing mechanisms for the observed relation between the MPC and household income. Only with far-reaching additional assumptions, NK models can reproduce the observed net-positive multiplier effect of redistributive tax and transfer policies – based on a somewhat extreme bimodal distribution of households into savers and spenders. NK models that feature constraints to monetary policy near zero interest rates can match the strong rise of spending (as compared to tax) multipliers in crisis times, but the latter effect is very sensitive to the persistence of the fiscal shock and rests on questionably large intertemporal substitution effects of household consumption (McKay et al. 2017). Recent NK model extensions can cope with positive effects of fiscal stimulus on potential output during severe slumps, but the mechanisms are still subject to debate.

The PK model (including standard extensions) on the other hand, does a good job in matching the sizeable multiplier and MPC in normal times (though ignoring the observed increase in MPCs over time). Several PK extensions cannot convincingly explain the strong non-linearity of spending multipliers (as opposed to tax multipliers) in crisis times. Likewise, hysteresis effects that give way to a strong long-term effect of fiscal policy are a standard feature of the PK framework. However, the data suggest that such hysteresis effects seem to matter only during strong downturns. On the other hand, PK models incorporate a negative relation between the MPC and the income level (likewise based on an extreme bimodal distribution of MPCs out of wage and profit incomes) and thus can explain the positive GDP effects of fiscal redistribution. However, they lack a relation between wealth, debt pressure and the MPC that fits the data.

In the conclusion, I outline the elements of a fiscal policy model that draws on the saving and consumption motives in Chapter 9 of the *General Theory* (Keynes 1936) with extensions from the PK and NK frameworks. This model would feature a (muted) intertemporal substitution channel, a precautionary saving motive, basic needs consumption, liquidity constraints, a constrained monetary policy in downturns and uncertainty about future

income in an economy with an unequal distribution of income. Such a Keynesian fiscal policy model should meet all the stylized facts at the macro and micro levels.

This paper speaks to various strands of the literature. It draws insights from the rich empirical macroeconomic literature on the fiscal multiplier (Gechert 2015; Gechert/Rannenberg 2018; Hagedorn et al. 2019; Hall 2009; Hebous 2011; Ramey 2016, 2019; Spilimbergo et al. 2009) and the large microeconomic literature on the size of MPCs (Jappelli/Pistaferri 2010, 2014; Parker/Souleles 2019; Sahm et al. 2010). It is related to several studies that engage in a paradigmatic comparison of macroeconomic models, like Prante et al. (2020), who compare several policy implications of PK versus NK models; Hein (2014), who provides a paradigmatic introduction to different growth theories; or Lavoie (2006) who juxtaposes several heterodox approaches. It speaks to discussions about the development and interrelation of orthodox and heterodox macroeconomics (Colander 2000; Colander et al. 2008; Dullien 2017; Dobusch/Kapeller 2012; Lavoie 2012, 2018; Romer 2016). It relates to recent approaches towards a pragmatic reconciliation of PK and NK models (González 2022; Schoder 2015, 2017) and the endeavor to make NK models more realistic (Auclert et al. 2018; Bilbiie 2020; Hagedorn et al. 2019; Kaplan et al. 2018; Korinek 2018; McKay et al. 2016; Rannenberg 2021).

The paper is structured as follows: Section 2 describes the main features of NK and PK workhorse models with a focus on their fiscal policy implications. Section 3 then compares these implications with the macroeconomic stylized facts about the fiscal multiplier and the microeconomic facts about MPCs. The final section then concludes by pointing to major shortcomings in both approaches and outlining the elements of a model that could bridge the gap between the two schools of thought.

2 FEATURES OF NEW AND POST-KEYNESIAN WORKHORSE MODELS

This section focuses on the main characteristics of typical PK and NK workhorse models related to fiscal policy, avoiding a full-scale and formal description. The NK model I describe here is based on Woodford (2011), as it focuses on fiscal policy. The PK model refers to the neo-Kaleckian variety of the supermultiplier model, for which Palley (2019) provides a workhorse example. Both articles provide a relatively simple comparative-static discussion of the structure of these models, which eases exposition. However, this comes at the cost of complicating a comparison to the later presented stylized facts that rest on dynamic estimations of the multiplier and the MPC, and thus require an explicit time frame. Since the focus is on qualitative conclusions, the benefits outweigh the costs. For the sake of simplicity, I consider a closed-economy setting in this section but will refer to open-economy considerations, if necessary.

2.1 The post-Keynesian model

The PK supermultiplier model is derived from the logic of the Keynesian cross by which output and income are determined by aggregate demand. In the PK approach, this principle of effective demand prevails both in the short and long run. Aggregate demand consists of an autonomous demand component (including government spending, baseline consumption, and independent investment), income-dependent consumption and endogenous investment. The endogenous part of investment positively depends on capacity utilization (of the capital stock) in the short run and firms' expectations of demand growth in the long run. These long-run expectations are assumed to equal the growth rate of

autonomous demand, which determines the steady-state growth rate.³ In the short run, the positive dependence of investment on capacity utilization gives rise to an accelerator mechanism and a crowding-in of investment by additional government spending. Saving adjusts to overall investment via changes in income through the Keynesian multiplier process such that there is never a shortage of saving for investment and the paradox of thrift applies: a higher propensity to save reduces aggregate demand and income. Consequently, it does not lead to higher but potentially lower saving.⁴

Income is distributed in the form of wages and profits, whose relative shares are influenced by power structures and determine demand and growth. They influence consumption demand, since the MPCs out of profits and wages are assumed to differ. These MPCs are structural parameters of the model, that is, they are fixed. The MPC out of wages is usually assumed to be close to or equal to one, while the MPC out of profits is smaller and may even be close to zero. A redistribution from profits to wages usually increases the average MPC and consumption demand. The average MPC is a main determinant of the multiplier effect as in the Keynesian cross. It is always positive such that additional government spending crowds in private consumption expenditures.

The supply side comes in via a Leontief aggregate production function in labor and capital. Labor supply is usually abundant while the capital stock is underutilized and grows with aggregate demand such that supply constraints normally do not bite. Price adjustments are second order to quantity adjustments and may only become relevant in a boom or depression. That is, price crowding out of fiscal policy is typically irrelevant in normal times.

Due to the crowding-in of both private investment and consumption and without retarding factors, the fiscal multiplier in the plain vanilla PK model is in the range of three to four. There are three main extensions that reduce this effect. First, in an open-economy framework, part of aggregate demand leaks out via imports and thus reduces the domestic aggregate demand effect. Second, a tax on income or aggregate demand slows down the propagation of initial government spending in the private sector. At the same time, this allows for the assessment of a tax multiplier. The tax multiplier is lower than the spending multiplier, as it follows the same income-to-spending propagation but misses the initial direct demand effect of government spending. Third, private investment spending could be sensitive to a pro-cyclical interest rate, which might be set by the monetary authority leaning against the wind, or private banks/investors demanding a pro-cyclical mark-up on the monetary policy rate. This boils down to a downward-sloping IS in conjunction with an upward-sloping ('structuralist', Palley 2013) or flat upward-shifting ('horizontalist', Lavoie 1996) LM curve. However, the interest channel is weak if the interest elasticity of investment is low, which is a standard PK conjecture.

2.2 The New Keynesian model

The simple analytic NK model as described in Woodford (2011) starts out from a neoclassical general equilibrium model with labor being the only production factor, assuming away capital and investment for simplicity.⁵ The economy produces a single

3. Palley (2019) describes this as the concept of rational expectations within a PK setting.

4. The combined workings of the multiplier and accelerator may create an instability. Stability is usually ensured by assuming that investment reacts less to changes in the capacity utilization than saving (Foley et al. 2019).

5. Alternatively, the standard assumption in a model with capital would be to have a Cobb–Douglas production function with unitary elasticity of substitution between labor and capital, which is however questioned by the data (Gechert et al. 2022).

output good which can be used for private or government consumption (the demand components). Private consumption is paid out of accumulated lifetime labor income, subject to a lump-sum tax by the government. Government consumption is paid for by these lump-sum taxes. It could in principle also be financed by debt issuance, but the transversality condition, a crucial element to make the intertemporal structure of the model solvable, requires that the government redeems the debt by tax revenues eventually.

The model features perfect competition in goods and labor markets (that is, no extra profits, no price setting power, labor being paid its technically determined falling marginal product) and a perfect financial market (allowing borrowing or lending over time at a unique interest rate).

A representative household engages in intertemporal optimization of utility as determined by private consumption and leisure (time endowment minus work time). The government expenditures provide no utility to the household. Labor supply depends on the net wage and the relative utilities of consumption and leisure. Consumption demand in a period is subject to the very same relative utilities, an intertemporal budget constraint, an intertemporal substitutability of consumption, and a discount rate for future consumption (the Euler equation). Today's consumption thus rises with a higher lifetime net labor income, a lower interest rate, a higher discount rate, and a higher relative utility of consumption over leisure. This consumption function is in line with the permanent income hypothesis (PIH) (Friedman 1957; Hall 1978). The MPC after a transitory increase in income is close to zero in the short run, as the shock adds little to permanent income and the additional consumption is spread out over the entire remaining lifetime. However, the MPC after an unexpected permanent income increase is close to one instantaneously. Due to the forward-looking skills of the household in the model, this is even the case for anticipated future income changes.

Yet, these mechanisms, which arise for example after an increase in the marginal productivity of the household's labor supply, should not be misinterpreted to apply to a government spending increase. Aggregate demand is supply-constrained by the production function and hence higher government spending crowds out private consumption. Moreover, since the additional government spending requires higher taxes at some point, the household's lifetime wealth is reduced, forcing it to consume less and save more today (that is, Ricardian equivalence holds). However, this negative wealth effect increases the marginal utility of consumption over leisure and stimulates the household to work more today (and in the future), thus increasing aggregate supply. All this creates a supply-sided fiscal multiplier effect, which in the simplest model only depends on the relative marginal utility of consumption over leisure (increasing the multiplier) and the degree of intertemporal substitutability of private consumption (decreasing the multiplier in the short run). In such a purely neoclassical world, the (supply-sided) multiplier is positive, but necessarily smaller than one and likely closer to zero (Woodford 2011). When adding capital to the model, the positive supply effect on working hours would also increase the marginal product of capital and lead to crowding-in of investment, thus increasing the overall multiplier effect to some extent (Baxter/King 1993).

How do things change in a NK extension? As a first element, monopolistic competition introduces a mark-up (or a wedge) between prices and labor costs. This alone does not change the size of the multiplier, let alone its supply-sided logic. Augmenting the model with sticky prices, however, endogenizes the wedge. Then, additional government demand reduces the wedge, leading to higher real wages, higher production, and labor demand.⁶ This allows for government spending to have a direct effect on

6. A similar effect with different channels can be achieved by sticky wages.

output via aggregate demand. The demand-side channel, however, does not add to the supply-side effect but partly mutes it such that the fiscal multiplier need not be much higher in the NK world.

With these extensions, monetary policy can influence real activity via its command over the nominal interest rate and its indirect influence on the real interest rate. Since the real interest rate has a strong influence on current and future consumption via the Euler equation, the multiplier effects of fiscal policy strongly depend on the monetary policy reaction. Woodford (2011) shows that under fairly general assumptions about the marginal utilities of consumption and leisure and the degree of price stickiness, a transitory increase in government spending has a multiplier exactly equal to one if monetary policy maintains a constant real interest rate.⁷ So, there is neither crowding-in nor crowding-out of consumption. Notably, the effects do not directly hinge on the amount of slack in the economy. However, a higher capacity utilization (of the labor force) increases marginal labor costs and prices. This makes it less likely that the central bank maintains a constant real interest rate in upturns.

After all, the case of the constant real interest rate is merely hypothetical. The standard case is that the central bank is able and willing to steer the business cycle with interest rate changes (for example, following some sort of Taylor Rule). Any fiscal interventions change the effort by the central bank and lead to a different real interest rate. That is, expansionary fiscal policy during a downturn implies less expansionary monetary policy and a rise in the real interest rate relative to a scenario without the fiscal intervention. This crowds out private consumption and investment. Therefore, the multiplier effect is smaller than one under standard assumptions. Depending on the reaction function of the central bank, it could even be smaller than in the purely neo-classical version above.

3 STYLIZED FACTS AND THE MODELS

After having laid out the main features of the PK and NK approaches to fiscal policy, I now compare their implications with the empirical stylized facts. Three caveats are in order: first, the list of stylized facts is notoriously incomplete, but space is limited. Second, their generality can be debated. Nevertheless, they are based on a broad reading of the literature and seem to be fairly robust. Third, some of these stylized facts have no counterpart in the basic models just described. In this case, I will refer to established extensions from the literature. To qualify as an ‘established extension’, it should be incorporated by a considerable share of the literature or by highly cited reference papers.

3.1 The macro stylized facts

According to several overview studies (Gechert 2015; Gechert/Rannenberg 2018; Hall 2009; Hebous 2011; Hagedorn et al. 2019; Ramey 2016, 2019; Spilimbergo et al. 2009), I point out six central stylized facts about fiscal multipliers on the macro level (Ma-I to Ma-VI) that will be discussed one-by-one in relation to our two models.

7. The effects would revert to the neoclassical case and therefore be smaller for a persistent increase in government spending. They would be larger for a credibly announced future spending reversal, which boosts current private consumption in the NK model (Corsetti et al. 2012).

Ma-I: During times of normal capacity utilization, the spending multiplier is roughly one.

In the baseline representative agent NK (RANK) model according to Woodford (2011), this result is an extreme case, which could only be achieved if the central bank maintains a constant real interest rate and the government spending shock is short-lived. Under normal parameterizations, the spending multiplier would rather be around 0.5, featuring partial crowding-out of consumption and investment. While crowding-out of investment can be found in a number of empirical studies (Blanchard/Perotti 2002; Barro/Redlick 2011), most studies report a crowding-in of private consumption (Blanchard/Perotti 2002; Fatás/Mihov 2001; Galí et al. 2007; Gechert/Mentges 2018). As shown by Galí et al. (2007), to bring the standard NK model in line with this evidence, requires a substantial fraction of non-Ricardian 'Hand-to-Mouth' (HtM) households⁸ in what is now called a two-agent NK (TANK) model (Bilbiie 2020). HtM households will play a decisive role to match the NK model with several of the stylized facts discussed below. This extension shares similarities with the PK model. Still, typical calibrations of a share of HtM households of ca. 30 per cent (Gechert 2015) would leave the multiplier far below one. An additional assumption of non-competitive labor markets, where wages would be entirely controlled by unions, based on which firms chose labor demand, would be necessary to reach a multiplier of one (Galí et al. 2007). However, this would take the model away from the baseline case in several dimensions.

The PK supermultiplier model in Palley (2019) would clearly transgress the boundary with a spending multiplier in the ranks of three or four, as it entails strong crowding-in effects of both consumption and investment. However, adding some realistic features to the model, like an open-economy setting with import leakage, a tax leakage by the government itself, or interest-elastic investment in conjunction with pro-cyclical interest rates will be sufficient to bring the multiplier down to one.⁹ The interest channel would also be relevant to enable the PK model to mirror the observed crowding-out of investment in linear estimations.

Ma-II: During times of normal capacity utilization, the tax multiplier is on average slightly smaller than the spending multiplier.

While the selective literature review of Ramey (2019) comes to a different conclusion, the bulk of empirical estimates in more comprehensive studies (Gechert/Rannenberg 2018) finds that tax multipliers are on average smaller than one. Even if the baseline models in Palley (2019) and Woodford (2011) do not cover tax shocks, one can derive what the respective approaches would imply. Again, the PK model (with the above-mentioned extensions) makes it easy to meet this stylized fact. The logic of the Keynesian cross has it that the tax multiplier will always be smaller than the spending multiplier. Also, simplified NK models can produce tax multipliers smaller than spending multipliers: if the tax is modelled as lump-sum, the tax multiplier is quite small due to Ricardian Equivalence. Yet, if the tax is assumed to be distortionary, which is a standard conjecture in NK models, the tax multiplier can easily exceed the spending multiplier.

8. The NK literature has developed various forms of such HtM households under the names of 'non-Ricardian', 'Keynesian', 'myopic', 'rule-of-thumb', or 'liquidity-constrained' households. While the underlying assumptions differ, they exhibit similar MPCs close to one.

9. While these factors could be easily calibrated to match a spending multiplier of one, in a fully-fledged model they would need to be matched to further empirical regularities about import propensities, elasticities of the tax system, and the sensitivity of investment to interest rates. This would go beyond the scope of the present paper.

Ma-III: During times of considerable recessions and crises, the spending multiplier is much higher, more in the range of two.

This is a very robust finding in the literature. The difference to normal times multipliers is qualitative and not gradual. Since the outfalls of the Financial Crisis, many NK models have been extended to incorporate situations of a deep recession, where monetary policy is constrained by a zero lower bound (ZLB) of the nominal interest rate (Christiano et al. 2011; Eggertsson 2011). In this case, the Taylor Rule would advise an interest rate in negative territory, which the central bank cannot reach. A transitory fiscal expansion would then not be met by a nominal interest rate hike and the relatively higher inflation would even reduce the real interest rate. Due to the strong sensitivity of private consumption to the expected real interest rate, such passive monetary accommodation would considerably increase current consumption. The fiscal multiplier could then easily exceed two and is highly non-linear. While this result fits well to the empirical facts, it is highly fragile, hinging on the duration of the fiscal stimulus. If the stimulus persists longer than the ZLB period, the forward-looking consumption effects are turned upside-down: the expected crowding out and reduced inflation after the return to normal times strongly dampens current consumption and can even imply strongly negative short-run multiplier effects (Woodford 2011).

Within the PK model, it is hard to produce a non-linear multiplier effect. Since the models generally assume underutilized resources, there should not be a strong difference between the spending multiplier in normal times and crisis times. It requires extensions of the baseline model that render demand components endogenous to the level of capacity utilization.

One possible channel for such a non-linearity of the multiplier could be a pro-cyclical marginal propensity to import in an open-economy framework. However, according to the calculations for the PK model in Charles (2016, table 5), this can still only explain around 10 per cent of the empirical multiplier difference, even for a huge recessionary shock of around 8 per cent of GDP. A second channel may arise from a pro-cyclical profit share, implying an endogenous redistribution from low-MPC capitalists to high-MPC workers during downturns. Yet again, Charles (2016) finds that the impact on the multiplier is even an order of magnitude smaller than for the import channel and thus negligible even for large changes in the functional income distribution. An amplification of the redistributive channel might occur when a reduction in the profit share also reduces wage inequality (high managerial wages that are correlated with profit incomes versus low blue-collar wages). This would increase the MPC out of wages in the 'normal case' (Hein 2023, ch. 4.6). However, even if this would decouple the effect, it would remain small.¹⁰

A different argument for an increased multiplier during recessions comes in the form of induced investment spending (or less crowding-out of it). This could be implemented by a kink in the LM curve, which would be flat during a recession and upward sloping or

10. Charles et al. (2015) make another argument: in the face of a recession and falling incomes, capitalists would want to keep up their consumption level by resorting to accumulated wealth and thus increase their propensity to consume (relative to their falling income). This reasoning rests on a misunderstanding of the concept of the *marginal* propensity to consume. If capitalists reduce the dependency of their consumption on current income, they in fact *reduce* their MPC, while the measured propensity to consume (consumption-to-income ratio) rises. More consumption smoothing logically implies a lower MPC which should apply to both negative and positive income shocks. When the government raises its spending during a recession, capitalist households would symmetrically react less to the additional income created. So, the fiscal multiplier effect would be smaller, not larger! The model in Charles et al. (2015) indeed imposes a higher MPC out of capitalist income and thus creates a larger multiplier during recessions, but this is inconsistent with their own reasoning of consumption smoothing.

shifting otherwise. However, given the skepticism within the PK school regarding the interest elasticity of investment and the reaction of the LM curve in times of normal capacity utilization, the difference between the regimes in a PK model should be rather gradual. Alternatively, Setterfield (2019) presents a model with an increased sensitivity of investment spending to strong deviations from normal capacity utilization via endogenous animal spirits. He frames this as a ‘euphoria effect’ kick-started by government spending at the end of a long downturn. Indeed, such crowding-in of private investment may be a strong-enough channel to justify the observed doubling of the multiplier. Unfortunately, Setterfield (2019) does not provide a calibration to judge on the size of the effect.¹¹ Bachmann/Sims (2012) find evidence for a reinforced confidence channel giving rise to an inflated multiplier effect of this range, yet they do not analyze whether the channel works through induced private investment. Moreover, they claim that the effect is limited to government investment shocks. Further evidence is mixed. Auerbach/Gorodnichenko (2012) find clear crowding-in of investment in downturns and crowding-out in upturns after general government spending. Candelon/Lieb (2013), on the other hand, observe crowding-out effects of investment during recessions, while their strong multiplier effects are driven by a larger private consumption reaction. Fazzari et al. (2015) do not find robust crowding-in of investment during a downturn but less crowding-out compared to upturns. After all, the evidence is more in line with a reinforced sensitivity of private consumption spending rather than investment spending during downturns. The PK literature misses such a strong nonlinear consumption channel.

Ma-IV: During times of considerable recessions and crises, the tax multiplier does not increase.

The finding of a non-regime-dependent tax multiplier would fit well to the baseline PK model, in which demand constraints are the norm, such that there should be no substantial difference between normal times and recessionary times. However, if we consider the non-linear extensions as discussed for spending multipliers above, they should similarly apply to tax shocks. If tax changes are tilted towards profits, the low propensity to consume out of these incomes could lead to a weak multiplier effect, but there is no evidence for a preference of such tax changes during recessions. Thus, the PK model can only satisfy either Ma-III (but bear in mind the difficulties explained above) or Ma-IV, though not both at the same time.

The NK model with a ZLB constraint (notwithstanding the caveats outlined above) can account for a flat tax multiplier in combination with a regime-dependent spending multiplier. Again, the real interest rate channel is key: since tax cuts tend to lower inflation, they rather reinforce deflationary tendencies, increasing real rates. Therefore, they even imply negative multipliers for income tax categories (‘a paradox of toil’) and strongly positive ones for temporary sales tax cuts or investment tax credits, which, due to their temporary nature, increase future expected inflation and lead to a preponement of private spending (Eggertsson 2011). Demirel (2021) makes a complementary argument that labor income taxes distort labor supply less during recessions when labor demand is short and credit constraints force households to work more, irrespective of tax burdens. Labor tax cuts would then lead to weaker GDP effects than during normal times. The effects

11. Moreover, he admits that the channel would work symmetrically, and would thus in itself also imply a large multiplier during booms. This is clearly inconsistent with the evidence but might be tamed by the inclusion of explicit capacity constraints.

could even out over the different tax categories such that the average tax multiplier could remain flat as observed.

Ma-V: Transfer multipliers on average exceed tax multipliers, particularly so during crisis times.

In GDP statistics, public transfers are treated differently from government consumption since transfers do not have a direct GDP effect. In fact, they are equivalent to a negative lump-sum tax. Thus, with a uniform MPC, the transfer multiplier should resemble the tax multiplier. However, if transfers are rather targeted towards poor households with high MPCs, while income taxes are, to a larger share, borne by richer households with low MPCs, the transfer multiplier could exceed the tax multiplier (Gechert et al. 2021; Oh/Reis 2012).

The differential MPCs of workers and capitalists of the PK approach provide a channel to establish this effect and this may even be reinforced by extensions that incorporate heterogeneous MPCs out of manager salaries versus blue-collar wages. Moreover, if in a recession, transfers are particularly well-targeted towards high-MPC worker households, PK models can produce the observable increase in transfer multipliers in such a regime.

Baseline representative agent NK (RANK) models are inconsistent with this fact. If transfers are lump-sum and taxes are distortionary, they would even produce the opposite effect. It would require an unusually large share of the above-mentioned HtM households to compensate for this effect and for transfer multipliers to exceed tax multipliers.

Ma-VI: Multiplier effects have considerable persistence in crisis times.

As Fatas/Summers (2018) and Gechert et al. (2019) have shown, according to data from the euro area crisis, fiscal stimulus and austerity measures can have substantial effects not only on current, but also potential output. They qualify that these effects have been specific to this episode of a deep slump with uncoordinated fiscal and monetary policies and do not necessarily translate to other time periods, regions or small open economies.

In principle, the baseline PK supermultiplier model can cope with this fact. Since exogenous fiscal policy in less open economies determines the long-run growth rate, the multiplier effect is fully persistent. However, this model feature is independent of the phase of the business cycle and hence cannot replicate the observed regime-dependence.

The baseline NK model is incapable of producing hysteresis effects of fiscal policy (except for the case of government investment not considered here). Thus, multiplier effects are usually short-lived. Recent contributions addressing the persistence of the Great Recession discuss additional mechanisms in DSGE models, like productivity losses during protracted downturns (Anzoategui 2019; Engler/Tervala 2018), precautionary saving resulting from higher unemployment risk (Ravn/Sterk 2017) or unemployment persistence (Rendahl 2016), through which fiscal stimulus can have persistent effects on output. Usually, these mechanisms are confined to deep recessions, in line with the evidence above.

Table 1 summarizes the results from this section. Let's start with the rare similarities (Ma-IV + VI): Both models (considering some extensions) can cope with the fact of a linear and muted tax multiplier in downturns, and they may provide for hysteresis effects. However, the mechanisms are different. Regarding other questions, even the outcomes differ: the baseline PK model (with some extensions) provides a better fit for normal situations where the NK model ascribes too much strength to the intertemporal substitution mechanisms. On the other hand, the NK model (with some extensions) manages to

Table 1 Summary of stylized facts at the macro level and model fit

Macro Stylized Fact	PK Model	NK Model
Ma-I. Average spending multiplier ≈ 1	✓ (open economy, income tax, reactive monetary policy)	X (monetary policy Taylor rule)
Ma-II. Average tax multiplier < 1	✓ (open economy, income tax, reactive monetary policy)	X (distortionary tax)
Ma-III. Crisis spending multiplier ≈ 2	X (not via consumption)	✓ (ZLB, transitory shock)
Ma-IV. Crisis tax multiplier < 1	✓ (but only since non-linearity is weak)	✓ (ZLB, average of heterogeneous taxes)
Ma-V. Transfer multiplier $>$ tax multiplier	✓ (targeting to workers)	X (distortionary tax, would require large HtM share)
Ma-VI. Multiplier effects have considerable persistence in crises	✓ (though not special to crises)	✓ (though competing mechanisms under debate)

Notes: The table summarizes the macroeconomic stylized facts for fiscal multipliers and whether post-Keynesian (PK) and New Keynesian (NK) models are able to meet these facts (✓) or not (X). ZLB = zero lower bound; HtM = hand-to-mouth.

reproduce the specifics of crisis situations, which are by and large indifferent from normal in the PK world. In both models, some channels that engender the correct macro predictions (like the NK ZLB mechanism or the PK consumption function) seem shaky. Thus, they should come under scrutiny also from a microeconomic perspective.

3.2 The micro stylized facts

The stylized facts (MI-I to MI-IV) in this section will be largely based on the rich empirical literature on households' MPCs as derived from surveys and natural experiments. Jappelli/Pistaferri (2010) provide an early overview on the empirical literature, separated by the expectations and persistence of the income change. The case to consider is the one of an unexpected and transitory income shock as this provides a useful testbed of the fiscal stimulus case. Brief and recent overviews on the large literature related to this case are provided by Kaplan/Violante (2022) or Parker/Souleles (2019).

Mi-I: The average MPC one year after a transitory income shock is roughly 0.5 with a wide dispersion.

While the standard deviation for this point estimate is large, nearly all studies conclude that the average MPC is significantly larger than zero, rejecting the PIH. This finding can be easily reconciled with the PK model of a large MPC out of wages and a small MPC out of profits. Looking at the dispersion of empirical MPCs, one can indeed find heaps at zero and one, but there are a lot of intermediate cases (Jappelli/Pistaferri 2014) that are missing from the baseline PK model. There is also evidence that high-income / high-wealth households can have substantial MPCs (Kueng 2018). In addition, the time profile

of the MPC (how much of the additional funds does the household spend after 3, 6, 12, etc. months) is increasing in empirical investigations with an MPC of about 1/3 after three months. PK models do not incorporate an intertemporal profile of consumption, such that they cannot replicate this feature. More generally, the fixed MPCs of workers and capitalists, even if they provide a feasible shortcut, are a poor description of consumption and saving decisions. Many middleclass workers do have saving motives and will try to smooth consumption at least over extended periods.

On the NK site, RANK models would predict an average MPC close to zero in the short run, completely inconsistent with the evidence. TANK models would require a share of HtM consumers of more than 50 per cent, given their low weight in aggregate income and consumption. This is on the upper end of the spectrum in the literature, where the median is rather around 30 per cent (Gechert 2015). Likewise, the TANK model misses the significant share of intermediate cases with MPC between zero and one, and the observed large positive MPCs for unconstrained households. The increasing time profile of the MPC could, in principle, be replicated by Ricardian consumers that spread out the additional funds over time, but their MPC would be sloping up much too slowly.

Mi-II: The MPC falls with the households' income position (controlling for wealth holdings and age).

This fact is roughly consistent with the PK model, considering that low-MPC capitalists have a higher income than high-MPC workers. However, the effects are more gradual in the data and related to the size of income, not its source. Notwithstanding these caveats, on a qualitative basis, the PK model performs sufficiently well.

The RANK model, however, is ill-equipped to establish a negative relation between incomes and the MPC that goes beyond the influence from age. In TANK models, not income, but wealth has an impact on the MPC. Kaplan/Violante (2022) show that in the TANK model there is not even a strong correlation between income and wealth. In TANK, wealth poverty of HtM households primarily stems from high consumption, not from low incomes.

Mi-III: The MPC falls with the households' relative wealth position (controlling for income and age).

Since the baseline PK supermultiplier model does not include wealth in the consumption function, no such causation can be established. Indirectly, since workers have a large MPC, do not save and hence by definition cannot hold wealth, while the opposite is true for capitalists, a negative correlation appears. Yet, it follows straight from the linkage of the MPC to the income classes, not from households' considerations about their wealth. PK stock-flow consistent models, such as Godley/Lavoie (2007), feature financial wealth and a propensity to consume out of it, but since there is a single target-wealth-to-income ratio of the household sector, a higher wealth position implies the sector to spend a larger fraction of an income shock, inconsistent with the facts.

Likewise, the workhorse RANK model would be at odds with the facts, as the MPC would be close to zero and roughly independent or slightly positively related to the net wealth position. TANK models instead feature an extreme bipolar negative relation between wealth and the MPC: HtM households hold no wealth and have an MPC of one, while Ricardian households possess wealth and have an almost zero MPC. Again, there are a lot of uncovered intermediate cases, but the qualitative implications are roughly correct.

Table 2 Summary of stylized facts at the micro level and model fit

Micro Stylized Fact	PK Model	NK Model
Mi-I. Average MPC ≈ 0.5	✓ (but missing time structure)	X (too low even with HtM households)
Mi-II. MPC falls with current income	✓ (but related to functional income and too bimodal distribution)	X (no stand-alone influence from income)
Mi-III. MPC falls with wealth	X (no stand-alone influence from wealth)	✓ (with HtM, but too bimodal distribution)
Mi-IV. MPC rises with (perceived) debt burden	X (relation would even be negative, if included)	✓ (with credit constraints)

Notes: The table summarizes the microeconomic stylized facts for marginal propensities to consume (MPCs) and whether post-Keynesian (PK) and New Keynesian (NK) models are able to meet these facts (✓) or not (X). HtM = Hand-to-mouth.

Mi-IV: The MPC rises with the debt burden, financial stress or concerns.

Demyanyk et al. (2019) document that higher private indebtedness is associated with higher MPCs and thus a higher effectiveness of fiscal stimulus. If people are asked whether they have a consumer credit and how burdensome it is for them to pay down the debt, and if they are asked how stressed or concerned they feel with their financial situation, then these self-assessments strongly positively correlate with the MPC (even when controlling for income and wealth). That is, the worse the (perceived) financial situation, the more people would spend out of a windfall income (Jappelli/Pistaferri 2014). This pattern cannot be matched by a simple PK supermultiplier model with fixed MPCs out of wages and profits (where indebtedness would be ruled out anyways). It is also not consistent with richer PK models featuring endogenous optimism and pessimism, which would claim that under debt pressure, people would rather use the funds to deleverage, resulting in a low MPC.

Neither would a baseline RANK model allow for such behavior. However, if the answers are a sign of the severeness of households' credit constraints, an NK model featuring such credit constraints (which are a variant of the HtM behavior and have become a standard ingredient in many NK models) reproduces this very pattern. A credit-constrained household will not be able to meet its desired consumption level. At the margin, the windfall income relieves the credit constraint, and the household will spend much of it to come closer to its consumption target.

Table 2 provides a summary of the discussion about the micro facts. Again, the picture is mixed, and the overlap is astonishingly small, if existent at all. Importantly, even if the models check some of the boxes, there are caveats with respect to the precision or plausibility of the channels at work. I will come back to this point in the next section.

4 DISCUSSION AND CONCLUSIONS

From the summarizing Tables 1 and 2 in the previous sections, one might conclude that it would be best to build an eclectic PK-NK model that would in principle be able to meet all stylized facts. I do not think this is feasible and desirable. It is infeasible because some of the mechanisms would be inconsistent with each other (for example, a considerable PK multiplier in normal times and a strong NK ZLB effect). It is undesirable because

some features (like the oversensitive ZLB mechanism and the static PK consumption function) do not seem plausible.

So, what would be the features of a better model? First, consumption functions should be designed intertemporally such that consumption and saving follow a purpose. Keynes (1936) developed a comprehensive list of saving motives, including precaution, life cycle, intertemporal substitution, improvement, independence, enterprise, bequest and avarice.¹² For the focus of a short-run economic policy model and with a view to empirical relevance, one may consolidate this list to precaution, intertemporal substitution, and avarice. With respect to consumption decisions, Keynes names (among others) short-sightedness and ostentation. I would add basic needs (for example, Stone–Geary preferences) and mental accounting (Shefrin/Thaler 1988) to this list. The observed heterogeneity of MPCs of households could then follow from different strengths of these motives. An unequal distribution of income in combination with liquidity constraints, fundamental uncertainty about future income (Aiyagari 1994) and a flat LM curve in recessions are further essential elements.

A combination of these ingredients would achieve the following: consumption would drag income closely, but it would still be smoother than income (both at the micro and macro level). The MPC would be large on average, larger during recessions, increase over time, gradually fall with income and wealth levels and rise with the private debt burden. Consequently, the transfer and spending multiplier would be large in normal times, larger and more persistent during downturns and less dependent on the duration of the fiscal shock. The tax multiplier would be weaker and would not increase in recessions.

How so? Via intertemporal substitution in combination with a precautionary motive and a sufficient level of impatience, a negative though muted dependence of consumption on current and future real interest rate changes emerges (McKay et al. 2016). Current financial resources are more important for consumption than future expected income. This creates a large instantaneous and rising MPC over time (Hagedorn et al. 2019). The MPC is also negatively related to wealth, since poorer households abstain from borrowing (too much) but will relievedly spend much of an unexpected transfer (Carroll 2001; Deaton 1991). Mental accounting channels, aggravating the sensitivity of consumption to current income vs accumulated wealth and future income expectations, can generally lead to higher MPCs – also of richer households (Kueng 2018).

Stone–Geary preferences provide an intuitive way to make MPCs negatively depend on income. Liquidity constraints, which are more likely to bind during recessions, would amplify the MPC of poorer households. This would also inflate the spending and transfer multiplier in downturns. The tax multiplier would be generally weaker and would not be affected much if taxes are largely borne by higher income/wealth households who have a muted though still positive MPC that does not vary much with the cycle. Alternatively, the lower MPC of the rich may stem from an avarice motive with wealth being a luxury good that provides utility directly (Gechert/Siebert 2022; Rannenberg 2021; Carroll 1998). Such preferences over wealth, which could replace the precautionary motive, will also allow for only a muted elasticity of consumption to future interest rate changes.

The closest to what I have presented here is the intertemporal Keynesian cross model outlined in Auclert et al. (2018), which shares many of the elements and implications, though it lacks an analysis of recessionary phases. This is not the place for an own fully-fledged model. Such a model would allow to test the interactions between the

12. Browning/Lusardi (1996) branded these motives and added a ninth downpayment motive.

channels outlined above. Some of them might not work together or some might be redundant. Also, the resulting multiplier effects are yet to be quantified. I leave such an attempt for future research.

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