THE DECLINE OF THE DIRECT TRANSMISSION MECHANISM

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Abstract

Despite the oft-stated truism that inflation is the result of "too much money chasing too few goods," most contemporary research attributes changes in inflation and output not to changes in money or goods, but to changes in financial markets that influence lending, borrowing, and investment behavior. This paper shows how the so-called "direct" monetary transmission mechanism was abandoned for a focus on financial markets in the 20th century, with only a short period of revival that coincided with the monetarist movement. This paper also shows that disagreement about the importance of the direct channel explains many monetary debates.

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1. Introduction

Most economists teach their introductory students about inflation using an old truism: inflation is caused by "too much money chasing too few goods." To illustrate this idea, economists describe a typical inflationary process whereby people receive more money than they desire to hold and then endeavor to spend it, leading prices and, depending on how much of the increase is anticipated, output, to rise across the economy. This story is carried by most basic textbooks and used in endless exams (e.g. Mankiw 2015, 458).

Yet this simple inflation story is absent from advanced textbooks and almost all modern monetary research. Instead, economists attribute changes in inflation and output to changes in financial asset prices and yields that in turn influence lending, borrowing, and investment behavior, which only then influence prices and output. Central banks discuss the transmission mechanism as moving almost exclusively from the central bank interest rate or interest rates to financial assets and then to other sectors of the economy (Kuttner and Mosser 2002, 16: "The *interest rate channel* is the primary mechanism at work in conventional macroeconomic models"). While other channels of monetary transmission are often evoked, such as the "exchange rate channel," "wealth effects channel," "equity price channel," and the "bank lending channel," all operate first through changes in interest rates and financial assets (See Boivin, et. al. 2010; Cecchetti 1995; Miron et. al. 1994; Mishkin 1996).[2]

[2] The discussion of monetary transmission mechanisms crescendoed in the 1990s, as New Keynesian aggregate demand models and empirical tests of them came into widespread use. This led to a symposium on the monetary transmission mechanism in the *Journal of Economic Perspectives* (1995). The only writer in this symposium who mentioned a version of the direct transmission mechanism was the monetarist Allan Meltzer. According to Google Ngrams, the use of the phrase "monetary transmission" peaked in 2003, after which underwent a steep decline. https://books.google.com/ngrams

Why has the "direct" transmission mechanism of money to goods been replaced by a focus on interest rates and other "indirect" mechanisms operating through financial markets? This paper shows that the direct transmission channel was pushed into the background beginning in the early 20th century due to an increased focus on lending and banking operations in the marginalist school, which evaluated money as a type of financial asset that first entered the economy through the banking system. The direct channel re-emerged in the 1950s and 1960s as an adjunct to monetarism, which saw money as providing consumer utility, which utility households compared against durable consumer and real capital goods, as well as financial assets. The direct mechanism then disappeared again with the emergence of New Keynesian economics and the return to a focus on money as a type of financial asset. This paper shows that disagreement about the importance or even existence of the direct transmission channel helps explain many divisions in monetary thought.

Although the transmission mechanism is of course foundational for any theory of money, most monetary thinkers spend little time detailing the transmission mechanism or its implications for inflation and output. More often, such transmission discussions are qualitative preliminaries to broader discussion of monetary policy effects. This has meant that the history of changing ideas about the transmission mechanism has been a secondary issue in the history of monetary thought.[3] Many of the debates about the transmission mechanisms are further obscured because they do not

[3] For brief, earlier discussions of the history of the "direct" versus "indirect mechanisms," see Blaug (1985, 158-161) and Humphrey (1974) (which deals with the quantity theory of money in general but has some mentions of direct and indirect transmission mechanisms). David Laidler (1991, 1999a 1999b) has produced the most extensive work on different transmission mechanisms in monetary thought, but he does not focus on differences between the direct versus indirect mechanisms, which he believes is not an essential distinction, and his accounts end around the time of John Maynard Keynes. For discussion of monetarist transmission mechanisms that do not focus on a "direct" transmission channel, see Nelson (2003) and below. For discussions of transmission mechanisms in New Keynesian models, see Walsh (2010, 346); Goodfriend and King (1997, 233-4, 238, 259-60). For how these New Keynesian models could incorporate a direct transmission channel, see Ireland (2004).

deal with the existence or non-existence of certain variables in monetary models, but rather the order of influence in which such variables and equations are assumed to impact others. This paper shows that many monetary disagreements were rooted in confusion about how differing transmission mechanisms could lead similar variables to have different macroeconomic impacts.

2. The Marginalist Attack on the Direct Channel

The "direct" channel of monetary transmission has long been associated with the quantity theory of money, the idea that prices in an economy are proportionate to the amount of money in it, but few early economists explained how the monetary transmission process worked (See Sargent and Velde 2002, 115-6).[4] David Hume, himself an early quantity theorist, made an attempted explanation of such a process in 1752. Hume imagined some merchants or manufacturers, "we shall suppose, who have received returns of gold and silver for goods… They are thereby enabled to employ more workmen than formerly." Each of these workers "carries his money to market, where he finds every thing at the same price as formerly, but returns with greater quantity and of better kinds," pushing up sales and output at first, and then prices as merchants respond to the increased demand (Hume 1752, 48). We here have a complete model of transmission from money to output and finally to prices that would be a sturdy foundation for later generations of economists. Hume and other early quantity theorists rarely discussed the impact of an increased supply of money on interest rates, since one of their premier concerns was to counter mercantilist writers who argued that an increased supply of money could reduce interest rates and expand investment (See Hume 1752, 61-78; Smith 1776, 426-37). David Ricardo (1810, 40-1) said that the idea that more money could lower interest rates was an "absurdity." Increased money "cannot add to our profits nor lower interest" since the

[4] Earlier theorists tended to discuss the alteration in the value of money relative to the precious metals in it, usually by the government (as in when the government would "debase" coins). These earlier theorists did describe how such alterations would raise prices, but this was of secondary concern (See Oresme 1956).

"rate of interest [is] regulated by the profits on the employment of capital, and not by the number or quality of the pieces of metal."[5]

Yet in the late 19th century, monetary theorists began to think more about how money affected financial markets and vice versa. As banks and finance came into increased economic and theoretical prominence, new monetary thinkers adopted what Mark Blaug (1985, 21) called the "Cantillon effect" theory of monetary transmission, where the effects of money depend on how it enters the economy. The French economist Richard Cantillon, writing in the early 18th century, speculated that money brought up by say, gold miners, raised prices first in mining before it spread to other sectors. Cantillon also mentioned that new paper money brought into the economy by increased lending could reduce interest rates and therefore expand investment (Cantillon 2010 [1755], 147-9, 163). Cantillon's thoughts about the specific sectoral impact of an increase in financial funds, although a hasty speculation on his part, became essential for later generations of monetary theorists.

Alfred Marshall, the founder of the marginalist economic school at Cambridge University, was one of the first to discuss how interest rates and financial asset yields changed when new money supply went through bankers. When Marshall described an influx of previous metals into the economy, he imagined the bullion coming only into "the City" or the banks of London, which would then affect the interest rates these banks charged. In 1887 testimony before the British Gold and Silver Commission (1887, 6, 31; quoted in Keynes 1930, 191) he said, "If there is an extra supply of

[5] Even though Ricardo's contemporary Henry Thornton focused on how banks could create more or less "bank money" by changing interest rates, the effect on the economy in Thornton's discussion operated through the increased quantity of money emitted by banks leading to more spending in general, not through investment specifically responding to interest charges (see Thornton 1939 [1802], 195, 198, 107, 234-5, 239). Some modern economists argue that Thornton focused on the interest rate transmission channel but argue that he was ignored for most of the 19th century (Meltzer 2003, 20).

bullion, bankers and others are able to offer easy terms to people in business," because "a little extra gold, going as it does into the hands of those who deal in credit, causes the supply to rise relatively to the demand; the rate of discount falls below its equilibrium level…and therefore stimulates speculation." This "speculation" only thereafter stimulated more spending. Marshall later (1923, 256, quoted in Laidler 1991, 66) extended this idea by stating that most new money in a modern economy came through financiers, which "increase[d] the amount of command over capital which is in the hands of those whose business it is to lend to speculative enterprise. Having this extra supply, lenders lower still more the rate which they charge for loans," which leads to "more capital in the hands of speculative investors, who come on the markets for goods as buyers, and so raise prices." The transmission here went specifically through bankers and financiers and operated by causing a reduced rate of interest and then an increased supply of loans to businesses, not to a general supply of currency and more immediate spending by households.

Ralph Hawtrey, one of the new marginalists trained at Cambridge University, furthered the focus on interest rate transmission. In his book *Good and Bad Trade* (1913), he at first imagined a typical, quantity theory example of monetary transmission without banks, in the Humean tradition. He asked the reader to "suppose [a monetary] disturbance to take the form of a sudden diminution of the stock of money" in a situation when there "is no banking system." This disturbance would cause people to "restrict expenditure for a time in order to replenish their balances," leading to lower output and then prices (37-8). Yet Hawtrey claimed such sudden changes in legal tender money, what would later be called base money, were rare in a gold standard country, therefore changes would take place "not necessarily in the quantity of legal tender currency, but in the quantity of purchasing power, which is based on the quantity of credit money" provided by banks (73-4). The quantity of such credit money changed "whenever the prevailing rate of profit deviates from the rate

of interest charged on loans." Hawtrey thus formulated a precise mechanism whereby the interest rate could interact with and diverge from the "real" rate of profit, which therefore could affect the amount of credit and finally business investment decisions. Hawtrey called the potential divergence between real profit and interest rates, caused by either changing profit rates or changing moods and desire for reserves by bankers, "really the fundamental cause of fluctuations" in business, since it explained changes in investment behavior which themselves led business cycle changes (81, 76-7).

Early Cambridge marginalists also tried to base their theories about prices and output on the marginal decisions of households, including household demands for holding money. For the first time they attempted to discuss how individual decisions about the amount of money held could affect monetary policy separate from changes in the banking sector or in specie stocks. The Cambridge theory of money demand was M=kPY, with M representing total money in the system, k representing the proportion of total annual spending held as money, P representing the price level, and Y total income.[6] In Marshall's theories on money demand, individuals decided how much real money balances, k, to hold, with the marginal household decision being between spending more on goods or holding onto more money. Marshall (1923, 45) imagined an individual deciding whether to hold his wealth in the form of money or "in extra furniture" or "extra machinery or cattle," with the individual decision to hold more money (with the supply of money fixed) leading to lower spending on consumer goods and then lower prices overall.[7]

[6] Arthur Pigou, who created the first version of this equation (1917, 52-3), used slightly different nomenclature: R for total real resource income, and P as the price of money in terms of goods, instead of the inverse, and more typical, formulation, the price of goods in terms of money.
[7] David Laidler (1991, 62) called this continued inclusion of real durable goods in the money demand function a "source of confusion" since they were "hardly made on the margin."

Yet other marginalist theorists paid less attention to the demand for money versus consumer goods, as in Marshall's example of furniture, and focused on the demand for money versus other assets that provided profit or interest. Arthur Pigou imagined the demand for money competing only with interest or profit-returning assets, including not just financial assets but real productive assets, in both household and business decisions. Higher rates of profit would lead to lower demand for non-interest-bearing money (a lower "Cambridge k") and thus higher prices. Pigou (1917, 45-6) said the "chief factor upon which the attractiveness of the production use [of money] depends is the expected fruitfulness of industrial activity." If a businessman understands that "resources invested in his business will yield an abnormally large return, he will be more anxious than he otherwise would be to devote resources" that would have gone to holding money to production. By contrast, "the variable k will be larger the less attractive is the production use and the more attractive is the rival money use of resources." Thus the main influence on demand for money was the interest rate or rate of profit in alternative assets, not the potential purchase or prices of consumer goods.

Other theorists, such as Ralph Hawtrey in his work *Currency and Credit* (1919), compared money demand with only other financial assets such as bonds, whose higher or lower interest rates would lower or raise, respectively, the demand for money. Hawtrey argued that households and traders kept money to meet "unforeseen emergencies" and prepare for regular transactions between income payments, but this cash holding had a cost: "A balance of cash or credit is itself a source of loss… it is earning no interest." Interest rate changes determined by central banks or by the banking community could thus affect the demand for money even when held by non-bankers (36-7, 110).

It was left to John Maynard Keynes to extend these ideas about interest rate transmission, in both the business and household spheres, into a comprehensive theory in which there was no direct

transmission mechanism at all. In Keynes's mature formulas, he eschewed talking about emissions or retractions of money, and only focused on the central bank "Bank Rate" and how that rate directly affected investment and savings. In his most extensive monetary work, *A Treatise on Money* (1930), Keynes dismissed the traditional view that "regards Bank-rate merely as a means of regulating the *quantity* of bank-money," including, he said, in Marshall and Hawtrey (187-8). He knew that increased quantities of money in these theories caused by a low rate of interest went to more loans and investment, but thought previous writers had elided the direct importance of interest rates: "Marshall, unless I have misunderstood him, regarded the influence of Bank-rate on investment as the means by which an increase of purchasing power got out into the world," not an independent influence on other market interest rates and outcomes (197). Keynes, by contrast, viewed the "Bank rate" as the crux which determined the relationship between "Savings" and "Investment." Both savings and investment in Keynes's mind were determined independently by different groups, but both made these decisions based on interest rates, with lower rates relative to the "natural rate of interest," or the regular and expected profits of business, inspiring less savings but more investment, and higher rates the reverse. He argued that a bank-rate rise "upsets the balance between the value of investment and saving" by either "stimulating saving or by retarding investment" (200-1). The bank rate influenced what would later be called households' "liquidity preference," which, as in Pigou's and Hawtrey's formulation, influenced the amount of funds kept directly in interest-bearing assets versus pure money, but now without any possibility of direct spending on consumer or real capital goods. The goal of the central bank in Keynes's conception in the *Treatise* was to keep the interest rate at the "natural rate," explicitly using the formula of Swedish

theorist Knut Wicksell, from his own translation of Wicksell, in order to balance the desire for savings and investment, and thus total income in the economy.[8]

Keynes's *General Theory of Employment, Interest, and Money* (1936) clarified the implications of a pure financial focus of monetary transmission. In analyzing household money demand, he established what he called the "transaction" motives and "precautionary" motives for holding money. In his analysis, as in Hawtrey's, the amount of money held by a consumer related to "the amount of income and the normal length of the interval between its receipt and disbursement" (195-6), with these factors assumed as exogenous or fixed. In other words, these variables were assumed to influence, but not be influenced by, the amount of money held. Keynes's discussions (chapters 8, 9) of households' "propensity to consume" related that propensity only to changes in income, and not in money, meaning money changes per se had no direct effect on consumption.

By contrast, Keynes argued that the "speculative motive" for holding money had an important effect on macroeconomic policy, because it is "particularly important in transmitting the effects of a *change* in the quantity of money" into financial assets prices (196). Keynes argued that "actual aggregate rates of saving and spending do not depend on precaution" or other such motives for holding money, but "it all depends on how far the rate of interest is favorable to investment" and the speculative motive (111-2). Lower interest rates stimulated speculation and investment, which then

[8] Keynes (1930, 186) said that the one book which anticipated his own was "Knut Wicksell's *Geldzins and Guterpreise,* published in German in 1898, a book which deserves more fame and much more attention than it has received from English speaking-economists. In substance and intention Wicksell's theory is closely akin…to the theory of this Treatise." For focus on the *Treatise* as the basis of Keynes's monetary thought, see Leijonhufvud (1968). This paper does not focus on Wicksell's work, which is obviously crucial to the rise of the interest rate transmission channel (see Laidler 1999a), but which remained outside of the kenning of most English-speaking economists until the 1930s. Some researchers argue that Wicksell still maintained a belief in the direct transmission of monetary policy (Patinkin 1965, 581-2).

stimulated spending and then determined income. Thus income determined the amount of money spent, but money, without going through interest rates and investment, didn't determine income or spending.

Keynes added the corollary that increases in money might not cause reductions in interest rates below certain levels, which would lead to what would soon be called a "liquidity trap." The absence of a direct transmission mechanism is what made such a trap possible, since otherwise money could always translate directly into more consumer spending. As Keynes said, the very distinctiveness of money, which made it important in affecting interest rates, was its low carrying costs, which meant "money is a bottomless sink for purchasing power, when the demand for it increases, since there is no value for it at which demand is diverted…so as to slop over into a demand for other things" (231). In Marshall's and Pigou's formulation, such purchasing power could indeed "slop over" into real assets, but such was not possible for Keynes. This meant that in Keynes's formulation, only government fiscal efforts to use excess savings in new investment could restore full employment whenever market interest rates remained higher than the natural rate.

The Keynesian consensus that emerged beginning with John Hicks's (1937) IS-LM model of Keynes's General Theory formalized the idea of two separate monetary decisions. Money demand was determined by the interest rate and total output, $\frac{M}{P} = L(r, Y)$, while total output was determined by autonomous spending and investment, the latter of which was determined by interest rates, $Y = A + \mathrm{I}\,(\mathrm{r})$. Most importantly, the two equations separated money decisions into two distinctive phases: one where a household decided how much money to hold versus to save, and another where entrepreneurs invested that money, and not a single equation, as was implicit as far back as Hume, where households decided between goods, assets, and money.

"Neo-Keynesians" in the postwar period expanded on these ideas by creating more specific models about the demand for money relative to interest rates. William Baumol's and James Tobin's models of demand for money had households keep money only to prepare for unexpected, and therefore unwilled, commodity purchases or transactions, but the amount they kept for these potential transactions depended on the level of interest rates, which formalized models going back to Hawtrey. Tobin (1956, 242) imagined an individual receiving a sum of money, and "he disburses this at a uniform rate throughout the period, and at the end of the period … he has disbursed it all," with the rate of disbursement uniform and exogenous. His model household thus only decided on the margin between "cash C(t) and bonds B(t)." Baumol's (1952) similar money demand model was $L(Y, i) = \frac{M}{P} = \sqrt{\frac{CY}{2i}}$, with Y being the size of the paycheck in any period, C being the cost of withdrawing cash from the bank and i being the interest rate at the bank. The only alternative to holding money in these models was saving it; spending it was assumed to be already determined. Tobin's (1961) later formulation of money demand as a demand for a safe financial asset continued and extended the tradition of a pure financial focus of money. In these models, money-holders did not make trade-offs between financial and non-financial goods.

3. The Monetarist Counterrevolution – Reestablishing the Direct Channel

The potential for other channels of monetary transmission re-emerged in the 1950s as the often-unspoken subtext in the debate over the monetarist movement. Seen from this angle, the monetarists tried not merely to revive an older quantity theory of money, but also to revive the associated "direct" transmission mechanism of money, both of which Milton Friedman and other so-called monetarists had picked up from older American theorists. Yet Friedman and his followers

did not always make their arguments about the direct transmission mechanism clear, so the Keynesians who critiqued them had trouble placing monetarist models in their own framework involving interest rates.

The early 20th century American economist Irving Fisher was an important progenitor of Friedman's later reformulation of the quantity theory. Most economists have focused on the difference between Fisher's and Cambridge University's "equation of exchange" (see Keynes's analysis, 1930, 221-39). Fisher argued the monetary equation was best represented as MV=PT, or money times velocity equals prices times total transactions, as opposed to the Cambridge M=kPY. Writers have looked at Friedman's later demand for money equation and thought it would be more properly rated a Cambridge k mechanism, based on individual optimized decision to hold money (Patinkin 1974, 115-6), but they have ignored how Fisher's model tended to focus on money as something that was spent on goods, which thus had a direct impact on total spending, as opposed to money as a mere financial asset which lacked an interest-rate return.

Irving Fisher was not ignorant of the importance of the rate of interest. One of his most famous books, *The Rate of Interest,* was first released in 1907. He is also widely recognized to be the originator of the idea that the rate of interest reacts to anticipated changes in the purchasing power of money, which meant that expected inflation is manifested in higher interest rates and expected deflation in lower (Fisher 1896). Fisher's belief in how inflation influenced nominal interest rates meant he focused on the effect of expected changes to the purchasing power of money on interest rates, and not the reverse. His studies of expected inflation led him to argue (1907, 271) that "we can now understand why a high rate of interest need not retard trade nor a low rate stimulate it," since most changes in nominal interest rates came only from changes in expected inflation and thus had little

changes on the important "real" rate of interest. This focus caused him to minimize the interest rate transmission channel.

In Fisher's 1911 book *The Purchasing Power of Money,* he did incorporate interest rates in his transmission model, but just as one factor in "transition periods," where he showed how the delayed responses of interest rates could accelerate a monetary disturbance once begun. He began by "assuming a slight initial disturbance, such as would be produced, for instance, by an increase in the quantity of gold. This, through the equation of exchange, will cause a rise in prices." The first impetus for price and output changes went through commodities and prices here, not interest rates as in Hawtrey or Keynes. The anticipated rise in prices would cause the profits of business to rise as well, yet the "rate of interest will not adjust immediately," and will stay lower than the necessary real rate. This temporary reduction will cause an increase of loans and then deposits, and "this extension of deposit currency tends to further raise the general level of prices, just as the increase of gold raised it in the first place." This was a kind of financial accelerator effect, which in turn did have real effects on business investment and increased the amount of "unhealthy trade," as he termed it, that could cause financial crises. Yet it only followed from an initial real monetary disturbance and changes in the price level, not from more money supply directly affecting interest rates themselves (Fisher 1922 [1911], 58-9). Fisher said rather that the most important and "first cause of the unhealthy increase in trade lies in the fact that prices, like interest, lag behind their full adjustment and have to be pushed up, so to speak, by increased purchases… Likewise, we next observe that the rise in prices — fall in the purchasing power of money — will accelerate the circulation of money. We all hasten to get rid of any commodity which, like ripe fruit, is spoiling on our hands" (62-3).

Here the reduced demand for money during an inflation manifested not only increased holding of interest-bearing assets over cash but in increased spending on goods.[9]

Milton Friedman took Fisher's insights about the quantity of money's direct effect on spending and tried to incorporate them into a more complete and modern framework involving the demand for money.[10] In "The Quantity Theory of Money – A Restatement" (1956), Friedman attempted to rehabilitate a model that he said had fallen into "disrepute" since the Great Depression, citing Irving Fisher and an "oral tradition" at the University of Chicago as inspirations for his own restatement. Friedman took a large step away from the Keynesian tradition when he said that the demand for money on the part of "the ultimate wealth-owning units in society can be made formally identical with that of the demand for a consumption service," not a financial service. In Friedman's model money was not just a precaution for unexpected transactions, or an alternative financial asset. Money was a type of wealth that provided consumer utility, and therefore its demand was affected by the yield on many other types of wealth, including on consumer goods. Consumption was placed directly in an equation that involved a tradeoff with money-holding and was not just an endogenous variable of that responded to transitory income. Money demand was thus determined both by prices on financial assets and by prices on "physical non-human goods" and "human capital" (21). Friedman's money demand equation was $\frac{M}{Y} = f(r_b, r_e, p, w, \frac{P}{Y}, u)$, with returns on bonds and

[9] Ultimately, Fisher's discussion of interest rates and "transition periods," only occupies a few pages out of a 500-plus page book on purchasing power and is nowhere the centerpiece of the monetary thought as in marginalists such as Hawtrey. For a work which argues that Fisher focused more on interest rates, see Dimand (1993).

[10] Friedman (1970) noted that Fisher's model focused on money as a means of "payments" for consumer goods rather than just as an "asset" in the Cambridge equation. Edward Nelson (2002) has argued that Friedman and most monetarists never believed in the direct effect of the transmission mechanism, noting that both Friedman and Karl Brunner attributed small effects to such real balances on spending, although Nelson noted that monetarists supported "broad substitution effects" in their monetary transmission models, which sometimes included real assets as a variable, and in which new money additions were similar to wealth effects (286).

equities and the price of different sorts of real goods all determining the demand for money. Each of these forms of "wealth" provided a utility "yield" over some time period, so that a lower price for a real consumer durable could be analogized to an increase in its utility yield. This re-incorporated the direct transmission mechanism into modern monetary thought by allowing consumers to choose between money, goods, and financial assets, and by also given all different sorts of goods effective "interest rates" that could both affect, and be affected by, money. Financial interest rates in Friedman's model did affect the demand for money since they made holding non-interest-bearing money more or less expensive, as the Cambridge economists had argued, but they were just one factor of many. The most direct way to change macroeconomic variables in Friedman's model was merely to change the amount of money in the system, since an increase in money led to more spending on all goods, or, conversely, in Friedman's formulation, a rise in price and a decrease in the yield on all assets, real and financial.

Friedman and David Meiselman (1963) described how the transmission process could work in such a model. They imagined a typical situation in which the Federal Reserve purchased Treasury bills. They argued that any purchase of bills led to an increase in money in household portfolios which would lead to a "bidding up of the prices not only of fixed money claims but also of equities and such real assets as houses, land, and the like." They even noted that the "first impact may be on goods rather than securities. And more generally, the readjustment will take place simultaneously in all areas…on both what is termed investment and what is termed consumption" (220-1).

In another 1963 article, Friedman and Anna Schwartz included a section on "A Tentative Sketch of the Mechanism Transmitting Monetary Changes." Friedman and Schwartz hypothesized open-market purchases that led to portfolio changes but argued that these portfolio effects must "be

interpreted much more broadly than they often are" to include "also a host of other assets, even going so far as to include consumer durable goods, consumer inventories of clothing and the like." They claimed that "money is a stock in a portfolio of assets, like the stocks of financial assets, or houses, or buildings, or inventories" and households or businesses who acquired more of it had to evaluate money holding against all these other assets (61, 70).[11]

In Friedman's later presidential address to the American Economic Association, he said the "revival" of monetary policy "was strongly fostered among economists by the theoretical developments… that pointed out a channel- namely, changes in wealth, whereby changes in the real quantity of money can affect aggregate demand even if they do not alter interest rates" (Friedman 1968, 2). The existence of the direct transmission mechanism of money to consumer goods is one reason Friedman did not believe in "liquidity traps," since the reduction of the interest rate was only one means to elicit more spending, which could also be encouraged by a greater quantity of money (Friedman 1969, 4-7).

The same year as Friedman's first quantity piece, as if by divine coincidence, to use a later monetary phrase, a University of Chicago graduate, Don Patinkin, published his similar but much more extensive work, *Money, Interest, and Prices,* which he updated and expanded in 1965. In this book, Patinkin also returned the direct transmission mechanism into play, arguing, "Money buys goods,

[11] In Friedman and Schwartz's *Monetary History* (1963b)*,* released also in Friedman's *annus mirablis,* they noted several times when American consumers made a clear tradeoff between goods and money balances (643, 672). One review of the book noted the importance of money affecting spending directly and claimed that their monetary model was "virtually indistinguishable" from Friedman's *The Consumption Function* book of 1957, connecting the desire for a predictable stock of real balances for consumption and increases of money increasing real wealth to the permanent income hypothesis (Clower 1964, 370).

and goods do not buy money. The natural place, then, to study the workings of monetary forces is directly in the markets for goods. This will be our central theme" (1956, 1; 1965, xxiii).

Patinkin had already made an important contribution to the revival of the direct transmission mechanism. In 1948 he countered the then-common Keynesian notion that a modern monetary system did not have to return to equilibrium at any particular level of prices or output by identifying what he called the "real balance effect" or "Pigou effect" (see 1965, 19, where he claims the attribution to Pigou was a mistake). He noted that money itself was an asset with a fixed nominal value, so a price level drop increased the real value of an individual's holdings of money, leading people to spend more of that money on goods and services, pushing aggregate demand back up to equilibrium over the long run. Yet the effect of a price level drop on increasing real balances, often misidentified as the only means towards creating a real balance effect, was just one part of a broader direct transmission mechanism in Patinkin's work. In his book, Patinkin focused on the consumers' demands for real balances, and noted that although in most modern Keynesian analysis, the influence of changes in real balances had "been recognized in the analysis of demand for *bonds,* it has not been so recognized in the analysis of the demand for *commodities*." Patinkin also attacked the "extreme Keynesian assumption that changes in the amount of money directly affect only the bond, and not the commodity, market" (18). Unlike earlier quantity theorists, however, he admitted that the demand for money was not "independent of the rate of interest" on other financial assets. He tried to reintegrate both commodity and bond markets into his analysis, by looking at the "dynamic interactions between price-level variations in the commodity market and interest-rate variations in the bond market. The interdependence of markets is a fundamental and recurring element of the argument" of his book (xxiv). Patinkin showed that both the demand for consumer goods and

changing interest rates which made the holding of non-interest-bearing money either cheaper or more expensive affected the demand for money and therefore prices and output.

Patinkin's model of aggregate demand for commodities was Y=f(Y, r, M/P), and in this equation real money balances, M/P, exerted a direct influence on total demand, Y. When he discussed consumers' scheduled buying of products, as in Baumol and Tobin, he noted that schedules were not fixed, but that individuals could adjust their balances, in other words, spend more or less money on goods, to "assure their complete adequacy for any possible time pattern of payments" (83). He argued that early economists had not recognized the real balance effect because they did not understand a situation "in which people increase their *flow* of expenditures because they feel that their *stock* of money is too large for their needs," while previous attempts by marginalists to bring marginal decisions to bear on the stock of money holding "led to an undue concentration on the money market, a corresponding neglect of the commodity" (165-7).

Patinkin's theory thus provided many parallels to Friedman's, though it was much more extensive in its applications and organized into an explicit general equilibrium framework. Yet each writer analyzed their intellectual tradition in a distinct way. Friedman placed himself in the quantity theory tradition and thought he was expanding it to include financial and other assets. Patinkin claimed that he was carrying forward the Keynesian "liquidity preference" view of money holding and at the same time bringing monetary analysis into a world with commodities as a potential consumer option. Patinkin (1972, 885-7) complained that Friedman should have "described his conceptual framework as a particular instance of the Keynesian liquidity-preference theory," and lamented the quantity theory's ignorance of "one of the central issues of monetary economics – the influence of the rate of interest on the demand for money," although in fact Friedman continued including

interest rates in his money demand models.[12] Also, Patinkin's focus on the "real balance effect" which operates directly on output and treats an increase in money as largely an increase in wealth that leads to immediate consumption, was somewhat distinct from the direct monetary transmission in Friedman's and other monetarists' models, where the focus was on how increased money led to a portfolio rebalancing towards different types of yield-providing assets, and which viewed even consumer durables as types of yield-producing assets.[13] These historical and doctrinal differences kept the two theories from being recognized as fundamentally similar arguments rooted in a similar idea about the direct transmission mechanism and led to more confusion among opponents and even allies of monetarist ideas.

Other economists in the monetarist tradition endorsed the broad channel of monetary transmission. Karl Brunner and Allan Meltzer (1964) complained that one problem with Keynesian theorists such as Baumol and Tobin was that they treated "payment schedules" in their money demand models as

[12] Paul Samuelson, and many other economists, made the same critique that Friedman and the monetarists ignored changes in interest rates in fluctuations of money demand. The repetition of this charge, despite Friedman's repeated disavowals and continued inclusions of interest rates as a factor in his models, resulted from one article Friedman wrote in 1959. Friedman (1966) claimed that "I know of no empirical student of the demand for money who denies that interest rates affect the real quantity of money demanded - though others have misinterpreted me as so saying." He claimed "This misunderstanding stems from my article "The Demand for Money: Some Theoretical and Empirical Results, 67 J. Pol Econ. 327 (1959). The empirical demand function presented in that article did not include interest rates as a variable," but that was only because he said the empirical evidence showed that money demand was not "highly sensitive" to interest rates. He later amended even that empirical claim.

[13] The subtle distinction between ideas about how real balances added to total wealth and affected immediate consumption, which was the focus of Patinkin, and about how changes in money affected portfolio decisions, including through purchases of consumer durables with implicit yields, which was the focus of the monetarists, explains why monetarists occasionally dismissed the importance of real balance effects in the same articles in which they discussed the direct effects of money on real goods and prices. See Brunner and Meltzer (1972b) and Friedman (1972). Laidler (1999b), for instance, dismisses the idea of real balances affecting spending directly, but notes that the monetarist viewpoint has the "transmission mechanism" work through changes to "unobservable implicit own rates of return on such items as money balances and consumer and producer goods" as opposed to just financial assets. Nelson (2003) notes Friedman's and other monetarists' focus on a broad spectrum of yields, but argues that those are best approximated by long-term securities yields, as opposed to entering physical goods into an IS or Phillips Curve equation.

exogenous factors: "These schedules are not imposed on the group [of agents] once and for all but emerge from the interacting, searching and adjusting behavior of the agents composing the group." Keynesians thus unnecessarily limited the optimizing behavior of their agents: "Of course, the adherents of the transactions idea quite clearly indicate that schedules pertaining to conversions between money and financial assets result from optimizing behavior. But their argument seems to deny such adjustments for the remaining payment schedules… When the costs of holding money rise sufficiently high, the range of adjustment of payment schedules extends over the complete range. Even the most immutable portion of these schedules can be adjusted, at a finite cost" (263-4).

Brunner's and Meltzer's models for monetary transmission also focused on money as a form of wealth in a portfolio, and therefore on how households exchanged money for all different types of assets. Like Friedman, they included a larger number of assets and yields in their money demand models than the singular Keynesian interest rate. In their model: "Wealth owners are permitted to choose between money, bonds, real capital, and current expenditure" (Brunner and Meltzer 1972, 974). They argued that direct transmission through real capital assets was particularly important: "wealth is allocated between financial assets and real (i.e. nonfinancial) assets in response to the yield rate on various types of assets. This allocation pattern determines a crucial link in the transmission mechanism. An adequate explication requires a careful description of the public's stock-flow behavior bearing on its real capital position" (Brunner and Meltzer 1963, 374-5). Meltzer (1995) later noted that one of the most important aspects of the monetarist movement was the broader range of assets that were included in the transmission mechanism relative to the Keynesian tradition and noted specifically the importance of including both financial and real assets in model portfolios. He discussed how changing prices of real capital goods induced "asset owners to shift into [or out of]

real capital." (For discussion of Meltzer's transmission mechanisms, see Ireland (2019); Nelson (2019)).

The ongoing debate on the nature of the monetarist movement and Friedman's views in particular led many economists to demand a more complete and formal statement of the monetarist position, and Friedman obliged in two pieces, in 1970 and 1971, in the *Journal of Political Economy* (see background in Nelson (2020b, 198-203)). The responses of five critics, and Friedman's response to those responses, which were later assembled into a book, demonstrate better than any other work how confusion about the transmission mechanism divided macroeconomists in this era.

The consensus both then and now was that Friedman's attempted general equilibrium quantity theory was a restatement of a Keynesian IS-LM model, which was ultimately "unsuccessful" (Bordo and Schwartz 2004, 218-9). Friedman did indeed create a simplified IS-LM model, similar to those of many of his critics, but instead of closing the system by assuming prices were fixed in the short-term, as the basic IS-LM assumed, or that output was fixed, as he claimed the basic quantity theory model assumed, he closed the model by allowing money to influence total nominal income and spending directly. As he said, "For monetary theory, the key question is the process of adjustment to a discrepancy between the nominal quantity of money demanded and the nominal quantity supplied… The key insight of the quantity-theory approach is that such a discrepancy will be manifested primarily in attempted spending, thence in the rate of change in nominal income" (Friedman 1970, 225-226). The divergence between the quantity of money demanded and quantity of money supplied directly influence nominal income, and this nominal income then went back to

influence variables like investment, prices, and output.[14] Although Friedman admitted only a modest originality in his overall formulation, he believed that the crucial closing of the sequence of equations through a demand and supply of money equation and a nominal income equation with money as an argument demonstrated the distinctiveness of the monetarist model from the Keynesians'. He thus claimed that the direct transmission mechanism was the crux of the monetarist-Keynesian divide.[15]

Yet Friedman's use of a base IS-LM model to ground his theory confounded many of his readers. Brunner and Meltzer, in their commentary on Friedman's piece, claimed "that Friedman's acceptance of the IS-LM framework and this view of the transmission mechanism…brings him into general agreement with the neo-Keynesians about the transmission of monetary policy" (Brunner and Meltzer 1972a, 846). Unlike Friedman's model, which had a simplified single interest-rate yield, but which had that yield determined by nominal income, Brunner's and Meltzer's models worked first through changes in money that determined spending, inflation, and output, which then determined nominal income. James Tobin (1972, 853) said that the main issue over the past 20 years

[14] He noted that the division of the effect of changes in nominal spending between either changes in output or inflation was not easy to determine, and he kept that division outside his model.

[15] Edward Nelson argues that Friedman did not believe in direct effects of monetary supply outside of financial asset interest rates. He does note that Friedman's 1956 model included physical capital and real goods as an argument in the money demand function but argues that empirical research minimized the importance of this channel, after which it could be reasonably excluded from Friedman's model (Nelson 2020b, 189-91). Nelson also argued that Friedman did not believe in a determination of nominal income growth separate from its components. Yet Freidman's statements in both his 1970 theoretical piece cited above and the aptly titled 1971 "A Monetary Theory of Nominal Income" would belie this. Friedman said that the "missing equation" provided by modern monetarism was "using the quantity theory to derive a theory of nominal income rather than a theory of either prices or real income" and that nominal income had a closer empirical relationship to money than either real output or prices (1971, 323, 334). Nelson does not discuss Friedman's particular focus on the independent determination of nominal income in his analyses of the articles of the *Journal of Political Economy* debate (Nelson 2020b, 202-10). Nelson (2002) does agree that Meltzer believed in the direct effects of monetary policy. It is worthwhile to note that others at the time recognized that Friedman and the monetarists focused on the effects of money on nominal magnitudes, and generally left unspecified how those magnitudes disaggregated into output or inflation changes (Johnson 1971, 12).

between "monetarists and the neo-Keynesians" was the "shape of the LM locus," namely, that Keynesians thought money demand responded strongly to interest rates, while monetarists supposedly did not. Tobin and others and therefore saw Friedman's (in reality restated) claim that interest rates were an argument in the function for money demand as an important concession that upended his previous stance.

After the publication of Friedman's articles and their responses, Friedman (1974b) added one significant addition when they were combined into a book: four paragraphs that explicitly discussed the transmission channels through which monetary policy influenced macroeconomic variables. Friedman said that the one of the most important but "subtle" differences between monetarists and Keynesians "is in the transmission mechanism that is assumed to connect a change in the quantity of money with a change in total nominal income… The Keynesians regard a change in the quantity of money as affecting in the first instance 'the' interest rate, interpreted as a market rate on a fairly narrow class of financial liabilities. They regard spending as affected only indirectly as the changed interest rate alters the profitability and amount of investment spending… We, on the other hand, stress a much broader and more 'direct' impact on spending." He argued that individuals with excess money "will try to pay out a larger sum for the purchase of securities, goods and services." As opposed to the "Keynesians…We insist that a far wider range of assets and interest rates must be taken into account-such assets as durable and semi-durable consumer goods, structures and other real property." Friedman argued that Keynesians had trouble describing "houses, automobiles, let alone furniture, house-hold appliances, clothes and so on, in terms of the 'interest rate' implicit in their sales and rental prices" (like Marshall, bringing furniture back into the demand for money function). Friedman claimed Keynesians' ignorance of varying returns of consumer utility goods

"forced the transmission process to go through an extremely narrow channel" of bonds or financial assets, which he, like Patinkin, Meltzer, and others, thought unrealistic (190-1).[16]

Tobin also added a postscript in the republication of his article to discuss Friedman's new paragraphs on the transmission mechanism, which again demonstrated the gulf of misunderstandings. Tobin (1974, 89) first claimed Friedman's supposed distinction about transmission mechanisms was non-existent. Friedman's approach to the various asset demands for money was "quite standard" which "'neo-Keynesian' monetary economists have been teaching and expounding on for years. It is, for example, the principal point of my own 'portfolio' approach to monetary theory," along with other Keynesian models, which "link monetary policies via financial markets and intermediaries to the markets for producer capital, houses, and durable goods." But of course Tobin's portfolio theory and his description here took the transmission mechanism first through financial markets and only then to other commodities. Tobin then switched tacks and denied any other potential ramification of Friedman's transmission formula by claiming "Friedman has never offered any argument, theoretical or empirical" that shows "direct effects of the *quantity* of money, effects which bypass credit and securities markets and leave no imprint on interest rates and prices of traded assets."

In his final, amended, response, Friedman (1974b), stated that Keynesians had made important contributions to monetary thought in looking at money as affecting investment, but said that the monetary effect on investment needed to be interpreted "much more broadly than neo-Keynesians

[16] Patinkin also responded to Friedman's article and spent much of his response critiquing Friedman's doctrinal framing of his paper as being in the tradition of Fisher, but he admitted that Friedman's paper "yield[s] a model which I have developed a length elsewhere" (Patinkin 1974, 119). He of course had no argument with Friedman's belief in direct transmission and had noted that Friedman recognized this effect as early as 1953 (Patinkin 1965, 637).

tend to interpret it." Increased money did not merely affect capital, inventories, and so on "to which the neo-Keynesians tend to restrict 'investment,'" but all utility-enhancing purchases. In the end, Friedman could only say that much of Tobin's criticism "leaves me utterly baffled. We seem to be talking at cross-purposes" (140, 143). Indeed they were, and at the heart of their misunderstandings were different assumptions about the foundational issue of the transmission mechanism.[17]

Other contemporaries, however, recognized that monetarists had restored the direct transmission mechanism to monetary thought. One commentator argued that "Friedman's writings appear to support this direct transmission mechanism" and that "a direct mechanism is also implicit in Friedman's work on the demand for money" (Argy 1969; see also Makinen 1981, 439-441). Thomas Humphrey (1974, 18) argued that "the analysis of the transmission mechanism is a key point in the monetarist-Keynesian controversy" since monetarists believe people spent their "excess money balances" through "producer goods, and durable and semi-durable consumer goods." The monetarists thus adhered to the older tradition of "direct transmission."

4. New Keynesianism and the Disappearance of Direct Transmission

As the story has often been told, from the late 1970s, Friedman and monetarists triumphed strategically but lost tactically. Thanks to an assist from the rational expectations revolution, monetarists convinced central banks and economists that money in the long-term was neutral, that monetary policy was the almost sole determinant of inflation, that fiscal policy had important limits,

[17] Friedman and Schwartz (1982) later reemphasized that excess cash tends to affect all of a household's portfolio, which the household tried to adjust "by replacing cash with other financial assets (including both securities and physical assets.)" They noted that although Keynesians tried to explain transmission through "lower interest rates, and [how] the lower interest rates stimulate business investment, which in turn has a multiplier effect on spending," along the "broader monetary lines we prefer" the portfolio imbalance "raises the prices of sources of service flows relative to the price of service flows themselves." Such service flows could be provided by consumer goods (485-486).

that rules-based policy had advantages over discretionary policy, and so forth. Yet the monetarists lost the argument that there was stable relationship between some defined class of assets called "money" and nominal spending, and also lost the argument that some "monetary aggregate" itself was an important and predictive variable for total spending. Monetarist policy survived without the influence of specific monetary quantities. The "New Keynesian" revolution that followed in its wake was, in effect, monetarism without money (Goodfriend and King 1997; DeLong 2000).

What is oft forgotten in this story is that the monetarists also lost the battle of the transmission mechanism, and that the "New Keynesians" therefore carried on the old Keynesian focus of the "indirect" method of monetary transmission through financial assets. The earliest New Keynesians focused on the effects of sticky prices and used money supply rules that affected nominal income in their models, but the transmission mechanism was rarely described. The focus remained on how to model changing expectations and market imperfections or "frictions" in a way that created output variations due to unexpected monetary policy changes (see Fisher 1977; Taylor 1979; Blanchard and Kiyotaki 1987). In these efforts, the New Keynesians were in almost complete agreement with the old monetarists. The only significant distinction was their attempt to explicitly model how sticky prices affected total output, and how to put them in general equilibrium models, which put them more in the tradition of Patinkin than Friedman.

Some of those economists later denominated New Keynesian began to re-examine and formulate their own "demand side" models of monetary transmission in the 1980s. This new "money" channel of transmission, sometimes confusingly called in this literature the "direct" channel, was assumed to work through interest rates' effects on financial assets and investment spending (see, e.g., Calvo 1983, 393). The new academic focus on interest rates was a result of both empirical changes and

theoretical innovations. The well-known break-down of the relationship between monetary aggregates and prices or output in the 1980s led to the search for different measures of the stance of monetary policy. The instability of monetary velocity or v, meant that it was difficult to model or discuss monetary relationships using a stock variable m, or total money supply, however defined (see Romer and Romer 1989). This absence left real or expected interest rates as perhaps the only measurable variable of a monetary policy stance, just as the Federal Reserve and other central banks began targeting interest rates directly. Ben Bernanke (1993) surveyed previous empirical results to say that "interest rates might, in fact, be better indicators of policy actions than the monetary aggregates." At the same time, Christina Romer (1992), while stating that she was working in the tradition of Friedman, identified real interest rate changes as the independent variable to explain output changes the Great Depression, as opposed to Friedman's measures of money in that period. Later evidence seemed to show limited relevance for money changes outside of changes to interest rates (Ireland 2004).

The Cantillon Effect, although not named as such, also came back into play to explain the theoretical importance of financial markets for the transmission process. New Keynesians emphasized the importance of the "liquidity effect" of increased money on financial markets, namely, that increased money supply would create temporarily lower nominal interest rates in financial markets, as opposed to the long-term Fisher effect of an increase in money supply raising expected spending and inflation and therefore creating higher nominal rates. These theorists relied on an uneven distribution of new monetary injections, largely into banks, to explain the predominance of the liquidity effect. In 1983 Sanford Grossman and Laurence Weiss modeled an economy where central bank open-market operations injected new reserves directly into the banking system, which they said "differs from a transfer to each agent proportional to his existing nominal

balances." In their theory, to keep financial markets stable "agents at the bank must be induced to hold the whole of the increase" in new reserves, but to dispose of this increase "banks must lower the real and nominal interest rates" (872).[18] As Robert Lucas (1990, 262) said in creating a model based of these innovations, "To predict the consequences of such a change [in money supply], one needs to know *where* it is as well as *how* much there is." In a similar vein, Lawerence Christiano and Martin Eichenbaum (1992) said that "a positive money shock increases the total percentage of the money supply available to financial intermediaries," which "lend all the cash at their disposal to firms. However, this requires firms to absorb a disproportionately large share of new cash injections. For firms to do so voluntarily, interest rates must fall." They argued that their model "corresponds to an interest-rate-smoothing rule of the type allegedly pursued by the Federal Reserve Board" in recent periods (348, 352).

Another strain of New Keynesian theory attacked the idea that central banks' focus on a sole interest rate would ignore the broad effects of money or be destabilizing. Some noted that despite monetarist emphases on broad substitution effects, in an infinite-horizon optimizing model, arbitrage conditions could link returns on different assets back to a one-period yield security (Lucas 1988; for discussion, see Nelson 2004). Other theoretical results showed that contemporary New Keynesianism could fit well into a simple IS-LM model, in which real balances effects have no place, as long as the utility of consumption and real money balances were additively separable (see McCallum and Nelson 1999: Nelson 2002). New theoretical papers also showed how particular interest rate rules could create determinate price levels and stabilize output, thus contradicting earlier monetarists assumptions that interest rate targeting was inherently unstable (see e.g., McCallum

[18] They argued that their model differed from a "proportional transfer which would raise all nominal prices by the same percentage and thus have no real effect." As Stanley Fischer pointed out later, such a proportional transfer is necessary but not sufficient to prevent any divergent real effect (Fischer 1990).

1981). All of these ideas returned the marginalist and Keynesian interest rate transmission mechanism to the center of monetary theory.

The new work on the interest rate and liquidity channel of monetary transmission co-evolved with another, the "credit" channel of monetary transmission, as pioneered by Ben Bernanke (1983). In these new models, the "frictions" described in earlier New Keynesian models moved from the arena of output to the field of financial markets, and these frictions again created real effects on output and prices. Economists assumed this credit channel worked through the monetary authority's ability to affect the value of financial assets on the balance sheets of intermediaries or in the financial markets, which in turn affected how credit was provided through specific banking relationships or through changes in collateral values, respectively. At the root of these effects were what Bernanke and Mark Gertler (1989) called the "asymmetry of information" between borrowers and lenders that led to "agency costs" that increased substantially in times of financial turbulence. As Christina and David Romer said in their paper "New Evidence on the Monetary Transmission Mechanism" (1990) "Work over the past 15 years has suggested that imperfections are a central feature of capital markets," which can cause credit to be allocated by "quantity rationing rather than price adjustment and can cause a special role for lending by financial intermediaries" (149). In these credit models, the central bank did not have to operate on money at all, as Keynes himself once speculated. A central bank could directly control the interest rate without affecting money supply, and divergences between the real rate and the natural rate of interest affected asset values and the stance of financial intermediaries, and then prices and output. The 2008 financial crisis led many central banks to focus

on changes on interest on reserves as a means of monetary policy, which they hoped would affect bank lending and investment without directly influencing the quantity of money.[19]

In standard New Keynesian models, money became an unnecessary appendage. In one typical textbook, Walsh (2010), the section on "The Monetary Transmission Mechanism," says "The model…. assumes that the impact of monetary policy on output and inflation operates through the real rate of interest." This prototypical model has inflation caused by inflation expectations and the output gap or $\pi_t = \beta E_t \pi_{t+1} + k x_t$, while the output gap is determined by inflation expectations and the interest rate, $x_t = E_t x_{t+1} - \left(\frac{1}{\sigma}\right)(i - E_t \pi_{t+1}) + u$. Money demand can indeed affect the interest rate, $m - p = \frac{1}{bi}(\sigma y - i)$, but, as the author himself notes, this third equation is entirely unnecessary, and central banks could set the interest rate directly (346). The most important distinction between these new models and older ones is that while the old Keynesians focused on interest rate effects on investment and business spending, New Keynesians, often using a representative agent model, more often showed how interest rate changes could affect the "intertemporal substitution of consumption" of households.

The absence of the direct transmission mechanism in New Keynesianism was demonstrated in their retrospectives of monetary thought. Stanley Fischer (1990) in an anniversary analysis of Patinkin's 1965 work claimed that Patinkin said "there are no economic inconsistences in a model in which an increase in the stock of money has a real balance effect only in the bond market, driving down the interest rate, which in turn affects the demand for goods and thus the price level. Such a model is

[19] Interest on reserves can still be conceived in a direct transmission framework, where interest effects nominal spending through its direct effect on the "velocity" of money, including changes to the velocity of different levels of monetary aggregates. For discussion of how quantitative easing intersected with interest on reserves, see below.

close to the thinking expressed in the standard [modern] textbook exposition of the monetary mechanism, in which changes in the stock of money first create portfolio disequilbria, which affect rates of return, which in turn affect flows of spending" (5). He said as well that a model "in which the real balance effect does not have to appear directly in the goods market" would be more in line with contemporary theories. Yet while Patinkin did concede that a theory could be constructed where, "The real-balance effect never manifests itself in the commodity markets," only in the bond market and interest rates, he also emphasized throughout his book that this was "refuted by the aforementioned empirical studies of [wealth effects and] the consumption function" and there was "no reason to limit our monetary theory to this extreme case" (1956, 163; 1965, 180). In other words, Patinkin admitted that such a case was internally coherent, but thought it irrelevant. The New Keynesians had turned Patinkin's "extreme case" into the main case.[20]

It seems then that New Keynesianism has approached the point the Cambridge marginalist tradition did in the 1960s, when Harry Johnson asked "why a theory in which money is important should have turned into the theory that money is unimportant" (Johnston 1961, 15, quoted also in Leijonhufvud 1968, 113). The focus on interest rates also returned modern monetary theory to a point similar that analyzed by Knut Wicksell's speculative "cashless society," as Michael Woodford makes clear in his frequent discussions of Wicksell in the influential *Interest and Prices* (2003).

5. Conclusion

[20] In many modern money-demand models, such as those of Randell Wright and many of his coauthors, there are no direct macroeconomic impacts of money outside of interest rates, just as modern research into the Money in the Utility models (MIU) and Cash in Advance models (CIA) is largely devoted to explaining the costs of inflation on money holding, not its independent impact on output outside of interest rates (See Ricardo Lagos and Randall Wright 2005; Walsh 2010).

Christiano and Eichenbaum begin a 1992 article with a quote from James Tobin: "Experience and common sense tell us that... ordering materials and hiring workers... will look like a better deal if the prime rate is 6% instead of 8%." This is the basis of much of New Keynesian macroeconomics. A previous tradition had claimed that such rates were important but not essential, yet this tradition has faded.

There has been some recent theoretical and empirical research into the direct transmission mechanism and real balance effects. Ireland (2004) showed how and why one could put real money balances into both the IS curve and the Phillips curve equations, thus creating direct effects on output, and Ireland (2005) showed how, under some conditions, money can represent real wealth in infinitely-lived representative agent models and thus induce a real balance effect.[21] And while earlier work seemed to show limited effects of real balances on output when controlling for interest rates, some recent work shows strong independent effects of real money balances when using broader measures like Divisia (Hendrickson 2014; Belongia and Ireland, 2015; 2022). The increase of central bank balance sheets since 2008 and 2020 have also undermined previous arguments that base money in itself could have little effect since it was such a small proportion of nominal income. While some claim that modern quantitative easing "works in practice, but it doesn't work in theory," the possibility of a direct mechanism offers another reason to believe there would be an impact.[22]

[21]Nelson (2004) showed how IS-LM curves can fit into a monetarist framework with a focus on asset price substitution, and also (2002) how base money changes can have permanent and proportional effects on aggregate demand while still moving through a financial and interest rate transmission mechanism.
[22] Bernanke, very much in the New Keynesian tradition, tried to call "Quantitative Easing" "Credit Easing," since he saw its impact primarily in regard to interest rates and yields, and not on the quantity of reserves or money (Bernanke 2009).

It is difficult to know how a more substantial revival of the direct mechanism would impact monetary thought. At the least, in a direct transmission mechanism model, "liquidity trap" and "zero lower bound" problems would be of less importance. Likewise, the importance of central banks salvaging financial intermediaries and credit markets would decline since base money could affect non-financial asset values and output as well. Even if such direct transmission effects are small, in a world where creating new reserves remains costless, they offer opportunities for distinct strategies of monetary policy, including by imagining different effects of policies such as quantitative easing. As Patinkin (1965, 21) pointed out, the importance of such a real balance or direct effect "depends not on the *strength* of this effect but only on its *existence*." At least theoretically, no one can dispute its existence in some circumstances, since in economies without banking or financial assets, such as those which Hume theorized, increasing the amount of money will still increase prices.

The importance of the direct channel of monetary transmission can only be tested by further research. At the very least, its relative absence should be noted as monetary research continues.

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