Fiscal Policy Shocks and Real Exchange Rates

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Abstract

This study employs an instrumental variables (IV) approach to identify exogenous fiscal shocks, enabling us to provide evidence that increases in government spending cause real exchange rate appreciations. We study an U.S. intra-national setting where endogenous monetary policy is not possible and Ricardian equivalence is non-binding. Our baseline IV results suggest that a ten percent exogenous fiscal stimulus produces a real exchange rate appreciation of about 1.8 percent. Additionally, we find strong support for the Harrod-Balassa-Samuelson (HBS) implication that higher productivity/income growth leads to currency appreciation, a finding often obscured in settings with high currency volatility. We also find that the two components of a standard real exchange rate decomposition (traded goods real exchange rates, and non-traded goods relative prices) behave differently to government spending shocks, and the estimates of HBS effects are opposite. Finally, when government spending shocks are categorized into either investment, or consumption, we find that the largest effects on real exchange rates are investment shocks. Most, though not all of these empirical results are consistent with simple Neo-Classical and Keynesian theories.

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I. Introduction

One of the most important variables in open economy macroeconomic models is the real exchange rate, defined as the common currency relative price level between two locations. In a frictionless world, price levels might vary but this relative price would be constant and equal to one, i.e., purchasing power parity would hold. In fact, it is well known that real exchange rates often differ from one, and display little, or at best a very slow, tendency to adjust toward parity over time. More strikingly, real exchange rates are often found to be disconnected from fundamental economic influences altogether. Given the important role prices play in allocating real resources, these observations challenge conventional wisdom and have been the focus of a large empirical literature in international finance (see e.g., Obstfeld and Rogoff, 2001).

This study focuses on one important fundamental, namely unanticipated government spending. From a theory perspective, simple Neo-Classical as well as Keynesian models both predict real exchange rate appreciation in response to a fiscal stimulus.[1] However, as with many macroeconomic relationships, the existing empirical evidence is mixed; some studies find real exchange rate appreciation following positive fiscal shocks (e.g., Galstyan and Lane, 2009; and Ricci et al., 2013), while other studies (e.g., Enders, Muller, and Scholl, 2011; Kim and Roubini, 2008; Monacelli and Perotti, 2010; and Ravn, Schmitt-Grohe and Uribe, 2012) document statistically significant *depreciation* subsequent to fiscal stimulus.

We take the theoretical consensus as our starting point and focus on potential empirical resolutions to this puzzle. We suspect that existing contradictory empirical findings stem both from a failure to identify truly exogenous fiscal shocks, and from the impossibility of maintaining the necessary ceteris paribus assumption, when using typical observational data. In particular, important influences, especially monetary policy (both home and foreign), are not held constant in observational data – a fact that severely constrains the usefulness of such analyses, e.g., to make predictions, or to infer causality from the data. That is, since domestic and foreign fiscal policy, monetary policy, and the real exchange rate, respond to macroeconomic developments, i.e., are endogenous, tracing cause and effect poses significant challenges to standard approaches. The aim of this paper is to provide an estimate of the response of real exchange rates to exogenous fiscal

[1] There is not complete consensus however, see e.g., Obstfeld and Rogoff, 1995, or Ravn, et al., 2012.

policy shocks. We study a set of natural experiments, each of which resulted in a redistribution of federal spending intra-nationally, i.e., among U.S. states.

Our estimations are facilitated by employing an instrument for exogenous fiscal shocks, which enables us to cleanly estimate the real exchange rate response to changes in government spending. This intra-national setting has two key advantages. First, we can study fiscal shocks, i.e., changes in U.S. federal spending, at the state level; hence there is no corresponding change in future tax or budgetary implications. Another hurdle in studies of real exchange rates – the endogeneity of monetary policy, is also mitigated in our intra-national setting, since independent monetary policy (at the state-level) is not possible.[2]

We follow Cohen, Coval, and Malloy (2011), and instrument exogenous changes in government spending at the state level using changes in chairmanship of 'important' congressional committees. Cohen, et al. (2011) show that there have been more than 200 leadership shocks over the last 40 years, and that virtually every state has had a Senator or Congressman ascend to (and descend from), the chair of an important U.S. Congressional committee. They also demonstrate that the states with ascending (descending) chairs receive large positive (negative) shocks to federal-state transfers. Importantly, these chairmanship shocks are essentially random events which change the flow of U.S. federal spending from one state to another.[3] We confirm that these chairmanship shocks are strongly associated with changes in federal expenditures to states, as well as satisfying other statistical requirements for instrumental variables.

To operationalize our empirical tests, we construct U.S. state-level real exchange rates as the ratio of state-level Consumer Price Indexes (CPIs). However, since the Bureau of Labor Statistics (BLS) does not compute CPIs at the U.S. state level, we build these from an underlying sample of more than three million individual price observations using raw price data compiled by the American Chamber of Commerce Research Association (ACCRA).[4] Various authors have used subsets of the ACCRA data, including Parsley and Wei, (1996), but for this study we digitized the entire data set from its inception in 1968, and computed state price indexes using the BLS methodology. Despite covering relatively few (83) products and services from six major final goods and services categories, we find that simple averages of state level price indexes track the overall

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[2] Of course, a limitation of this intra-national setting is that the results apply most directly to small open economies.

[3] Cohen, Coval, and Malloy (2011) report that the median state receives nearly half a billion dollars in additional Federal earmarks, transfers, and government contracts as a result of a Senator or Congressman ascending to the Chair of an important U.S. Congressional Committee.

[4] Information about the data is available online at http://www.coli.org/.

U.S. CPI well. Overall, our sample covers forty-four years (1968-2011) for more than one thousand bilateral (state pair) intra-national U.S. real exchange rates.

As a starting point it is useful to begin by reviewing the predictions of a standard neoclassical model where the intuition is perhaps more transparent than in other (e.g., DSGE) more complicated models. The model allows perfect price flexibility, and has two goods: one whose price is set in international markets, i.e., demand is infinitely elastic. The other good is produced locally and is in fixed supply with inelastic demand; we refer to the good as non-traded, but that is not necessary for the model's real exchange rate predictions. The standard New Keynesian model, e.g., Gali and Monacelli (2008) yields similar real exchange rate predictions. Our discussion follows Froot and Rogoff (1991) who point out that the key assumption driving the model's real exchange rate prediction is that a larger fraction of government spending falls on local nontradables (N) than does private spending.[5] In this small country setting, the world price of tradables (T) taken as a given, and an unanticipated increase in government spending falling predominantly on nontradables will raise the relative price ratio $\left(\frac{P_N}{P_T}\right)$, and hence the overall domestic price level (P).

We follow Froot and Rogoff (1991), and define the real exchange rate (Q) as the price of domestic (indexed by *i*) goods relative to foreign (*j*) goods expressed in a common currency, i.e., $Q = \frac{P_i}{E_{ij}P_j}$, where E_{ij} is the nominal exchange rate expressed as foreign currency (i) per domestic currency *(j)*, and P_i , P_j are domestic and foreign price levels respectively. Note that in an intra-national context E_{ij} is just equal to 1; thus, an *increase* in Q implies that foreign goods have become relatively cheaper, corresponds to a *domestic* currency appreciation. Similarly, a rise in P_j implies a fall in Q, i.e., a domestic currency depreciation.[6]

More formally, assume a representative agent with utility function given by

$$U = \sum_{t=0}^{\infty} \frac{\beta^t}{1-\sigma} (C_{Nt}^{\alpha} C_{Tt}^{1-\alpha})^{1-\sigma}, \quad (1)$$

[5] Implicitly, government spending is viewed as consumption; treating government spending as productivity enhancing investment reverses standard model predictions. Hence, this could be a possible (if implausible) resolution of the puzzling empirical findings. In our empirical exercise we split federal government spending at the state level into either consumption or investment, based on observed proportions of state-level spending, to check for possible differential effects.

[6] Note this definition is opposite the typical formulation in international finance (though not in macroeconomics), where the real exchange rate is the relative price of *foreign* goods – and correspondingly, a *decrease* in the real exchange rate would correspond to a domestic currency *appreciation*. Here, we adopt the notation that an increase in Q implies a domestic currency appreciation, as in Froot and Rogoff (1991).

where C_{Nt} is consumption of the nontraded good measured in terms of the traded good at time t, and, C_{Tt} is consumption of the traded good at time t. The representative agent maximizes (1) subject to the budget constraint

$$W_{t+1} = r\left(W_t + Y_{Tt} + \frac{P_{Nt}}{P_{Tt}}Y_{Nt} - C_{Tt} - \frac{P_{Nt}}{P_{Tt}}C_{Nt} - Y_T\right). \quad (2)$$

In equation (2), W denotes wealth (measured in units of the tradable good), $\frac{P_N}{P_T}$ is the relative price of nontradables in terms of traded goods, τ_t is lump sum taxes at time t (which are assumed to satisfy the government's budget constraint, i.e., $\tau_t = \frac{P_{Nt}}{P_{Tt}}G_t$), and Y_T and Y_N denote domestic production of tradables and non-tradables, respectively. Maximizing (1) subject to (2), and imposing the equilibrium condition that total nontradable output each period (Y_{Nt}) is consumed either by the private sector (C_{Nt}) or government (G_t), yields

$$\frac{C_{Tt+1}}{C_{Tt}} = (r\beta)^{(\sigma+\alpha-\alpha\sigma)^{-1}}\left(\frac{Y_{Nt}-G_t}{Y_{Nt+1}-G_{t+1}}\right)^{(\alpha-\alpha\sigma)/(\sigma+\alpha-\alpha\sigma)} \quad (3)$$

and,

$$\frac{P_{Nt}}{P_{Tt}} = \frac{\alpha C_{Tt}}{(1-\alpha)(Y_{Nt}-G_t)} \quad (4)$$

By inspection of (3) and (4), a permanent rise in government spending permanently raises the relative price ratio $\left(\frac{P_N}{P_T}\right)$, and hence appreciates the real exchange rate. Similar logic applies to an unexpected increase in foreign government spending, with an opposite effect on the real exchange rate. This result holds for exogenous permanent increases in G, but also holds qualitatively for the case of temporary increases in G, and in the case where nontradable output Y_{Nt} increases in response to the increase in P_{Nt}.

We next turn to a brief review of related research in Section II. Section III describes the data on committee changes, as well as the construction of U.S. intra-national real exchange rates from underlying price observations. Section IV presents our results, including some robustness exercises, and finally, Section V concludes.

II. Review of Existing Evidence

The problem of measuring exogenous fiscal policy and maintaining ceteris paribus assumptions is not unique to studies of the real exchange rate. Indeed, these problems also loom large in estimating government spending multipliers, and were central in the debates over policy responses during the Global Financial Crisis of 2007-08 (Ramey, 2011). For example, the International Monetary Fund, in its 2012 *World Economic Outlook* (see especially p.41-43), reports that systematically low estimates of fiscal multipliers contributed to unexpectedly sluggish European recovery by encouraging overly aggressive fiscal consolidation among European governments. The particular ceteris paribus failures the IMF cites include a failure to account for synchronized fiscal consolidation, cross-country economic slack, and the zero bound constraint on monetary policy. Other authors have focused on intra-national evidence to mitigate these problems. For example, in their critique of standard methods of estimating fiscal multipliers, Nakamura and Steinsson (2014), take an intra-U.S. approach to estimate fiscal multipliers, because monetary policy is constant within the United States. They follow other authors (e.g., Hooker and Knetter, 1997) in instrumenting exogenous fiscal shocks using differences in federal military spending at the state level; the identifying assumption being that the United States does not embark on military buildups because states receiving larger shares of military spending are doing systematically worse than other states.

Standard common empirical methodologies used to estimate of the effects of fiscal shocks on real exchange rates are panel methods, and vector autoregressive models (VARs). Using panel methods, e.g., Galstyan and Lane, 2009, and Ricci et al., 2013 find that real exchange rates appreciate in response to fiscal stimulus shocks. Apparently, VARs are more likely to find the opposite. As is well known, the 'exogenous' shocks that are produced by VAR models rely on a number of strong assumptions leaving their 'surprising' findings open to criticism based on shortcomings of the method, e.g., omitted variables and 'incredible' identifying assumptions. Nonetheless, absent experimental evidence, VARs provide one method of identifying exogenous fiscal policy shocks.

Kim and Roubini (2008) focus on the United States experience in the post Bretton-Woods era of flexible exchange rates and explain their contradictory findings (real exchange rate depreciation) by citing an (exogenous) nominal exchange rate depreciation. In a similar setting, Monacelli and Perotti (2010), also using VAR methods, examine the U.S. and three other OECD economies over a time period similar to Kim and Roubini. They also find that real exchange rates depreciated in response to shocks to expansionary fiscal policy shocks but conclude the likely reason is related to the observed positive response of private consumption to the expansionary fiscal shock.

As a way to economically incorporate more data, and hence provide a richer VAR structure, Enders, Muller, and Scholl (2011) model the U.S. relative to an aggregate of industrialized countries consisting of the euro-area, Japan, Canada, and the U.K., and they derive and impose sign restrictions over parts of the impulse-responses of selected variables and over certain forecast periods following the shock while leaving real exchange rate dynamics unrestricted. Interestingly, their results confirm the puzzling behavior of the real exchange rate in response to exogenous expansions to fiscal policy. Enders et al. conclude by noting that some calibrated real business cycle models yield inconclusive predictions; hence the results tend to support some calibrations over others.

Additionally, Ravn, Schmitt-Grohe, and Uribe (2012) model some additional structure on the VAR by imposing the identifying assumption that only government spending shocks themselves can impact government spending within a quarter. They estimate their model using data from the U.K, Canada, Australia, and the United States, again over the post Bretton-Woods era, and they too find that the real exchange rate depreciated in response to positive government spending shocks. Confronted with this evidence these authors propose a model based on 'deep-habits' which leads firms to lower their markups following a positive fiscal shock, which translates into the observed real depreciation. The model also predicts that the decline in markups induces households to reduce leisure subsequent to positive fiscal shocks, contrary to a simple neoclassical model (e.g., Cohen, Coval, and Malloy (2011). Interestingly, their model does not rely on a traded/nontraded distinction since all goods are traded. The authors note that while the model does well on several dimensions, it cannot explain the persistence of the real exchange rate.

III. Data: Exogenous Fiscal Policy Shocks and state-level real exchange rates

Of course, modifying the theory is only one approach to resolving the puzzle. Given the theoretical consensus as a starting point, perhaps a more obvious approach is to consider possible empirical resolutions. These include acknowledging limitations of the VAR approach as well as considering ways of sidestepping the more general critiques of using observational data with its inherent limitation to statements about correlation.

Probably the most important critiques relevant to this puzzle are related to the ceteris paribus assumption. Monetary policy, in particular, is likely to be an important omitted variable since it is plausible that monetary policy can amplify, mitigate, or even negate fiscal policy effects. Moreover, post-Bretton-Woods U.S. history has had episodes of 'agreement' in fiscal and monetary policy stances, and, in other time periods these two important macroeconomic policies have been opposed. The real exchange rate response is likely to be very different in periods when fiscal policy and monetary policy are supportive than when they are in opposition.

Additionally, the importance of the ceteris paribus assumption is not limited to domestic monetary policy. Reverse causality is also a possibility. Indeed, the list of confounding variables is large since the real exchange rate is potentially affected by many factors, including fiscal and monetary policies abroad, shocks to productivity, political and legislative events, and disasters. Given that the impacts of each of these will also vary depending on whether they were anticipated, it seems reasonable to question whether they can be adequately summarized by the time series autocorrelation structure of a few domestic and foreign variables, as implied by the structure of VARs. Rather, it seems more likely that the puzzling fiscal policy/real exchange rate findings may well be due to inadequately controlling for variables that mask the causal effects of fiscal policy.

In this study we focus on exogenous changes in federal spending at the state level. According to Figure 1, Federal Spending accounts for about 20-25% (on average) of spending by state governments. The source of exogenous shocks to federal spending is changes in chairmanship of important congressional committees. ???

Cohen, Coval, and Malloy (2011) employ this instrument to study the impact of fiscal policy on investment by firms.[7] These authors show that changes in chairmanship are a good predictor of economically significant changes in flows of federal spending at the state level.[8] For example, federal earmark spending increases 40-50 percent, federal-state transfers increase about 10%, and government contracts increase 24 percent, in the year following an appointment. Subsequent to a change in chair, federal funds get redirected from the former chairman's state to the new chairman's state, i.e., no new federal government funds, or tax liabilities are created. This implies, for example that Ricardian Equivalence need not apply to this setting.

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[7] Following Edwards and Stewart (2006), Cohen, Coval and Malloy (2011) focus on ten committees in the U.S. Senate, and ten in the U.S. House of Representatives. The Senate committees are: Finance, Veterans Affairs, Appropriations, Rules, Armed Services, Foreign Relations, Intelligence, Judiciary, Budget, and Commerce. House of Representatives committees are: Ways and Means, Appropriations, Energy and Commerce, Rules, International Relations, Armed Services, Intelligence, Judiciary, Homeland Security, and, Transportation and Infrastructure. For this study, the data on congressional committees from Charles Stewart's website: http://web.mit.edu/17.251/www/data_page.html.

[8] We construct seniority shocks exactly as in Cohen, et al. (2011); specifically, we focus on their "ShockTop1ChairOnly" measure of changes in important congressional committee chairs. This dummy equals 1 if a senator or congressman of a given state first becomes chairman of an important congressional committee. Cohen, et al. (2011) construct other, more inclusive, shock dummies (e.g., including the ranking minority member), but find their results are consistent (though frequently weaker) across different dummy variable definitions. Cohen, et al. (2011) report 232 Congressional chairmanship changes, while we were able to verify 227 such changes.

There are several additional aspects of this instrument which contribute to its suitability. First, changes in chairmanship are determined almost entirely by seniority; changes occur whenever the incumbent retires, dies, or fails to be re-elected, or if the party controlling that particular chamber (House/Senate) switches. Moreover, these events are essentially unrelated to conditions in the ascending chairman's state, and most ascending Senators are not even up for reelection when they become Chair. Cohen et al. (2011), conclude that "thus, a congressman's ascension to a powerful committee chair creates a positive shock to his or her state's share of federal funds that is virtually independent of the state's economic conditions."

Second, as reported in Cohen et al. (2011), these seniority shocks occur "in large part, in different states (and years). Thus, each chamber's shocks can be seen as independent testing samples for the effect of these government spending shocks". Appendix Table 2 shows that all but two states (Colorado and Nebraska) have had one of their senators or representatives chairing a powerful committee. In terms of Senators, West Virginia and Arizona lead the pack with 9 and 7 ascensions, respectively, with the median being 2.5. In the House of Representatives, California is the outlier with 16 ascensions, but even here, the median state had only 3.5 ascensions.

Also, unlike national fiscal policy, these shocks represent a true spending shock without implications for future tax changes, i.e., when committees change chairs, only the location of the spending changes; future federal tax implications remain unchanged. Finally, since monetary policy does not independently and differentially affect interest rates and credit conditions at the state level, we can rule out monetary policy as a confounding omitted variable. Hence, we believe these features make a compelling case that we are able to focus on truly exogenous fiscal shocks, as well as being faithful to the ceteris paribus assumption necessary for econometric interpretation of the results.

We also collect data on: (1) state level population & per capita income data (BEA: 1968-2011, http://www.bea.gov/iTable/iTable.cfm?ReqID=70&step=1&isuri=1&acrdn=1) (2) US CPI inflation data (BLS: 1968-2011); (3) Federal Spending at the State Level (Census: 1968-**2009**); (4) State level nominal GDP (BEA annual data.xlsx).

We now turn to a description of the price data from which we construct state-level real exchange rates. ACCRA price data is becoming more widely used across a variety of specializations of economic research. Representative studies for example, come from Macroeconomics, e.g., Nakamura and Steinsson (2014); Health economics, e.g., Choua, Grossman and Saffera (2004); regional economics, e.g., Basker (2005); legal research e.g., Knoll and Griffith (2003); and international finance, e.g., Parsley and Wei (1996). Here we provide only an abbreviated description of the data since this is not a new research data base.

The Council for Community and Economic Research (C2ER) is the umbrella organization that is responsible for the cost of living data and their signature *Cost of Living Index* publication (hereafter, *Index*) as well as several other data products. According to the C2ER website the raw price data can be grouped into six major final goods and services categories: grocery items, housing, utilities, transportation, health care, and miscellaneous goods and services.[9] Each quarterly issue of the *Index* contains comparative average price data for a sample of urban areas, and a cost of living index computed from these data by the association. In this study we use only the raw price data and not the area cost of living index C2ER produces from the raw price data.

Briefly, since 1968, local Chamber of Commerce staff or volunteers for each Chamber have collected individual goods and services price data according to instructions provided by C2ER, which then checks the data for errors. The voluntary nature of the data collection results in a varying sample of cities included in each issue of the *Index*. In the first issue of the *Index* (1968 Q1) there were 127 cities and 44 items priced. The number of cities has increased to 314 (and 60 items) in the final quarter of our sample (2011 Q4). This changing sample of cities has the ultimate implication that, over the 176 quarters of the sample, there were over 900 distinct cities sampled. The *Index* is apparently aimed at cross-section comparisons at a point in time.

The goods and services reported in the *Index*, however, are much less variable, although there have been additions to and subtractions from the list as the relevance, and/or availability, of products and services (gauged by C2ER) has changed. Some goods or services have been replaced with ones more up to date as availability and tastes have changed. For example, there have been numerous packaging changes, e.g., in 1968 the 'soft drink' price referred to an 8 pack, 16oz., Coca-Cola. Today a soft drink refers to a '2 liter bottle Coca-Cola'. As another example of a change, the product 'Man's Denim Jeans', referred to: Levi's, 501s or 505s, rinsed or washed or bleached, size 28/30 to 34/36; however, this changed to 'Dockers No Wrinkles khakis', size 28/30-34/36'. Names and descriptions of the goods and services appear in Appendix Table 1. One final major change to the *Index* began in 2007, namely, C2ER began reporting three quarters per year, with the fourth quarterly publication being simply the average of the previous three quarters.

All of the pre-1990 quarterly *Index* reports were scanned and then converted to an electronic data set. The post 1990 data is available electronically from C2ER itself. All of the data were

[9] http://www.coli.org/Method.asp.

checked extensively for errors using outlier screens both cross-sectionally and in the time-series. For example, we started by checking for outliers of more than 100 percent of the median price across cities, order of magnitude price changes, and quarterly price reversals of 100 percent or more. Applying these checking procedures to the matrix structure of each quarterly data file (cities x items) helped identify the most common type of problem, i.e., those affecting many prices or cities simultaneously, e.g., due to skipping a city or price in the original data - resulting in all remaining data for that quarter being one column, or one row off. Orders of magnitude changes often occurred when the description of the good or service changed, e.g., from a 6-pack to a 4-pack. To be conservative, we coded a missing value each time the product description changed. Finally, each time an apparent error was found the original print documents were manually checked and if necessary, the electronic data set was corrected.

To compute state-level CPIs we weight the individual prices using the BLS expenditure weights. Figure 2 shows the overall grand mean inflation for each state plotted against the average U.S. inflation using data from the BLS. A regression of the state average inflation on the U.S. inflation yields a coefficient of 0.76 with a t-statistic of 11.74, and an adjusted R^2 of 0.77, confirming the visual correspondence in Figure 2. Figure 3 presents the data from a different perspective by plotting the time series of the average state-level inflation versus the overall U.S. CPI, by year. Again, the impression is that the simple state-level average tracks the BLS inflation series very well. A time-series regression of the state average inflation on the BLS inflation series yields a coefficient of 1.03 with a t-statistic of 11.91, and an adjusted R^2 of 0.78,

We also use federal-state expenditure data available from the U.S. Department of Census website http://www.census.gov/govs/state/. Since federal-state expenditure data is available only at an annual frequency, we conduct the analysis using annual real exchange rate changes. However, given that we start with more than 2.25 million quarterly price observations, this reduction in dimension is not overly restrictive, and leaves us with a panel (state-pairs x year) with over 30,000 observations for most of the analysis. After cleaning the raw data, we linearly interpolate the quarterly price data up to four quarters, and then aggregate to the state level using several different methods (using the average of all prices within a state, the median price, and the average price of the two most frequent cities) which result in qualitatively similar results. Throughout the rest of the paper we focus on annual state average price data, where the average is computed across all four quarters, using the two cities which appear most frequently in the *Index*. Table 1 lists the most frequently occurring two cities by state. Using this criterion results in four states lacking enough data to be included (Hawaii, New Hampshire, New Jersey, and Rhode Island); hence from the remaining 46 states, we construct 1035 (= 46x45/2) real exchange rates for the analysis. Tables 2 and 3 present some summary statistics for the available state CPI inflation data, and Figures 3 and 4 summarize the real exchange rate variability over the entire sample for all state-pairs.

In Table 2 we see that the number of states with CPI data increased steadily from a low of 30 in 1969, before rising to the 40's in the mid-1980s. We also note that inflation, based on the cross-state maximum and minimum columns, was not identical across states. Table 3 shows the cross-state variation in more detail. In particular, the northeast states of Connecticut (with 14 years), Maine (19 years), Massachusetts (19 years), and Delaware (22 years), have the fewest number of inflation observations, while about half of the states have 40 or more years of inflation data. At first glance, the mean across all states and years, at about 4.5% seems relatively high in today's context, but can be understood by noting that the sample includes the high inflation years of the 1970s and early 1980s, and by recalling that the sample excludes some of the well-known items with notoriously declining prices, e.g., computers. In Figure 3, the mean real exchange rate change is 3.67 percent, with some state level bilateral real exchange rates exhibiting 4 times the variability of others. To put this in perspective, using the average annual changes from the April 2014 World Economic Outlook of all 'advanced countries' using the IMF country classification, for all years available in the data base; that number is 4.02 percent. Hence, despite having a constant nominal exchange rate, U.S. intra-national real exchange rates on average exhibit comparable variability to country level real exchange rates (though the dispersion is much smaller for the intra-U.S. data). Finally, Figure 4 shows that while many real exchange rate changes are consistent with mean reversion, there is substantial variation about the mean. Indeed, roughly 10 percent of intra-U.S. real exchange rates experienced sustained absolute appreciations or depreciations of 25 percent or more. Besides highlighting the heterogeneity of intra-national real exchange rate experience within the U.S., these facts are noteworthy given the absence of barriers to economic integration in the U.S., as well as a single currency.

IV. Results: Exogenous Fiscal Policy and the Real Exchange Rate

According to the pared-down neoclassical model outlined in equations (1)-(4) above, an unexpected increase in government spending (G) in state *i* raises the relative price ratio $\left(\frac{P_N}{P_T}\right)$, and hence raises the price of state *i's* currency relative to state *j,* i.e., an appreciation the real exchange rate. Similar logic applies to an unexpected increase in foreign government spending (i.e., in country *j*), with an opposite effect on the real exchange rate. As discussed in Froot and Rogoff

(1991), this result holds for exogenous permanent increases in G, but also holds qualitatively for the case of temporary increases in G, as well as in the case where nontradable output Y_{Nt} increases in response to the increase in P_{Nt} (conditional on the rise in $\left(\frac{P_N}{P_T}\right)$).

Thus, we begin with a preliminary specification of the form:

$$\Delta q_{ij,t} = \alpha + \beta\left(\Delta g_{it} - \Delta g_{jt}\right) + \epsilon_{ij,t}, \tag{5}$$

where, $\Delta q_{ij,t}$ is the change in the log of the real exchange rate (at time t), α is a regression constant), Δg_{it} is the change in (subsequently, we measure *the shock* to) government spending at 'home', and, Δg_{jt} is the change government spending in the 'foreign' state.[10] Thus, the empirical model, accounts for *relative, or net* government spending shocks since it is possible to observe net state-pair changes in Federal government spending. The model predicts that an unexpected increase in government spending in state *i*, appreciates its real exchange rate from , i.e., H_0: $\hat{\beta} > 0$.[11] Similarly, if $\Delta g_{jt} > \Delta g_{it}$, then state *j'*s real exchange rate appreciates, i.e., $\Delta q_{ij,t} < 0$.

Table 4 reports OLS estimates from the specification given by equation (5). In columns 2-5, we successively add more influences on the real exchange rate suggested by theory (e.g., Harrod-Balassa-Samuelson), as well as additional controls to the regression. Of course, the interpretation of these OLS coefficient estimates is tentative since no attempt is made to address endogeneity. Nonetheless, the OLS estimates are a useful benchmark before turning to the Instrumental Variable results presented in Table 5. Next, Tables 6 and 7 check for differential effects of government spending shocks on real exchange rates for traded, and non-traded sectors respectively. Finally, in Tables 8 and 9, we attempt to categorize government spending shocks into consumption and investment spending to check whether the composition of government spending matters for real exchange rates.

In column 1 of Table 4, the estimates suggest that a ten percent increase in state *i* government spending (or equivalently, a decrease in state *j* government spending), accompanies a real exchange

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[10] For simplicity, here we include only a single constant term, but cluster standard errors at the state-pair level. In results not reported, including state-pair intercepts makes little difference to the results.
[11] Note that the model predicts a symmetric (but opposite in sign) real exchange rate response to government spending shocks in states *i* and *j*. Empirically, there may be reasons why e.g., a spending shock in (say) Alabama could produce a different result than in California. In unreported regressions, we find that in initial specifications including only government spending, estimates of $\widehat{\beta_i}$ and $\widehat{\beta_j}$ are not equal and opposite, though as more controls are added to the regression, the estimates converge. Hence, for ease of discussion and interpretation, we impose the restriction that state *i* and state *j* coefficients are equal and opposite throughout.

rate appreciation of about one-tenth of a percent, and the results are statistically significant at the one percent level. This compares to estimates (for EMS countries, 1979-1989) in Froot and Rogoff of about 3.7 to 4.5 percent, though their estimates were not statistically significant.[12] Of course, this regression omits other potentially important influences on real exchange rates, and we consider several of these in columns 2-6 of Table 4.

In column 2 we add time fixed effects to control for aggregate conditions affecting all states; the estimate on government spending (and its estimated standard error) changes little. We include time dummies in all subsequent specifications. One potentially important factor omitted from the simple model above is productivity growth. In our context, the textbook Harrod-Balassa-Samuelson effect predicts that higher productivity growth in state i is associated with a real appreciation (in state i) since wages and therefore prices rise in both traded, and nontraded goods sectors (due to limited cross-border labor mobility). Similarly, higher productivity growth in sate j will depreciate (i.e., lower Q) the 'home' real exchange rate. Hence, in column 3, we add relative per capita income growth as a control for differential trends in productivity growth

Despite this straightforward theoretical appeal, and the widespread foundational use in models of real exchange rates, empirical support for the Harrod-Balassa-Samuelson effect is generally weak in empirical studies (see summary in Taylor and Taylor, 2004), and the support that does exist is generally for the long-run, and in samples that include both rich and poor economies. The evidence in Table 4, however, strongly supports the Balassa-Samuelson effect, and the real exchange rate effects of productivity growth differences appear to be much stronger than those for government spending. According to the results in column 3, a ten percent increase in the per capita income differential between states i and j, is associated with a one percent currency appreciation. In a recent study focusing on disaggregated prices in the Eurozone, Berka and Devereux (2010) also find strong supporting evidence; they argue that intra-national real exchange rates lack the excessive volatility of nominal exchange rates and therefore may provide a cleaner setting to check for Balassa-Samuelson effects. Our evidence supports this conjecture. We also allow relative per capita income growth to directly impact the exchange rate elasticity of government spending. As can be seen in column 4, the effect is negative, but statistically insignificant, suggesting differences across states do not matter along this dimension.

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[12] Froot and Rogoff do report statistically significant estimates from 'levels' regressions, i.e., in regressions of the form: $q_{ij,t} = \alpha + \beta(g_{it} - g_{jt}) + \epsilon_{ij,t}$; we cannot replicate these regressions since we have data on price changes, not price levels.

In column 5, we follow Froot and Rogoff, and include the change in government budget surplus. Ignoring exogeneity issues, budget surpluses address what happens to the rest of state spending, outside of federal-state transfers. Froot and Rogoff argue that if Ricardian equivalence fails, an increase in the surplus should lead to a decrease in total expenditure, i.e., the signs should be opposite those on government spending shocks. In column 5, unlike the findings in Froot and Rogoff, the estimates on government surplus are statistically significant – suggesting changes in state government spending also have similar real exchange rate effects consistent with the model's predictions. For the case of U.S. intra-national real exchange rates, a ten percent increase in the relative budget surplus is associated with a half of a percent real exchange rate depreciation in state *i*. Finally, in column 6 we allow changes in state government spending to directly affect the exchange rate elasticity of government spending. As with per capita income growth, the effect is negative but statistically insignificant. It is likely that these OLS regressions violate some of the assumptions of the Classical Linear Regression Model – especially endogeneity. Hence, it remains to be seen whether the results in Table 4 hold once we adopt our instrumental variable (IV) strategy.

Table 5 presents our core set of IV estimates, and we follow the sequence of regressions as presented in Table 4. Test statistics for the IV regressions are given at the bottom of the table. First, the endogeneity test (Ho: government spending is exogenous) can be rejected in all regressions at around the two percent level, supporting the IV specification. The second test reported is for weak identification (Ho: the excluded instruments and the endogenous regressor are only weakly correlated). We report the Sanderson-Windmeijer (2016) F-statistic since we have only a single endogenous regressor - which is equivalent to the Kleibergen-Paap Wald rk F-statistic in our case. This test rejects the null for all equations. Finally, the under-identification test is given as the Kleibergen-Paap rk LM statistic, which is robust to serial correlation and heteroscedasticity. Again all specifications lead to a rejection of the null hypothesis that the model is under-identified.

The estimates in Table 5, are quite stable across the five specifications presented. Moreover, the estimates of the exchange rate elasticity of government spending are larger than the OLS estimates given in Table 4. The estimates suggest that a ten percent increase in state *i* government spending, causes a statistically significant real exchange rate appreciation of about 1.8 percent, which is about half the effect found by Froot and Rogoff for European fixed exchange rate countries.[13] The Balassa-Samuelson hypothesis continues to be strongly supported in Table 5, and the coefficient estimates

[13] Despite statistical significance of the interaction terms, neither the estimate of the effects of government spending shocks, nor the estimate of changes in the per capita income growth differential change materially when evaluated at the sample means, since these are very close to zero.

are only slightly smaller than those in Table 4. Here, adding interaction terms that allow relative per capita income growth to directly impact the exchange rate elasticity of government spending, we find the effect statistically significant at the ten percent level. The estimates in Table 5 suggest that higher productivity growth amplifies the impact of government spending shocks. In column 4 of Table 5 we include changes in the government budget surplus, and in the last column we interact changes in government budget surplus with government spending shocks. Though the coefficients remain negative, none of these estimates are statistically significant in these IV specifications.

Overall the results are consistent with standard neo-classical and Keynesian model predictions for the response of real exchange rates to fiscal shocks; namely, a 10% fiscal stimulus produces about a 2% real exchange rate appreciation.[14] Moreover, we find robust support consistent with the Harrod-Balassa-Samuelson (HBS) theory, i.e., real exchange rates respond more to fiscal shocks in states with more rapid income (productivity) growth. One question left unanswered is whether government spending shocks are having a direct effect on traded/non-traded prices as in the HBS view. We take up this question next by checking whether the traded-, and non-traded relative price components of the real exchange rate respond differentially to government spending shocks. Froot and Rogoff (1991), and more recently Monacelli and Perotti (2010), also provide (conflicting) evidence on this question.

Since our dataset contains the underlying constituent inflation series used to create the overall inflation rate, we constructed traded and (relative) non-traded portions of the real exchange rate, derived from a standard decomposition. That is, first recall that $Q = \frac{P_i}{E_{ij}P_j}$, or $Q = \frac{P_i}{P_j}$, since the nominal exchange rate is constant at 1 in an intra-national setting. A common heuristic assumes the aggregate price index in each location *i, j*, is a geometric weighted average of the prices of traded (T) and non-traded (N) goods prices, e.g., $P_i = P_T^{1-\omega} P_N^{\omega}$. With a little substitution and rearranging, changes in (Δ) the real exchange rate can be written as the sum of changes in traded goods prices, and in relative (nontraded/traded) prices between the two states:

$$\Delta\ln Q = \left(\Delta lnP_{iT} - \Delta lnP_{jT}\right) + \omega\left(\Delta\ln\left(\frac{P_{iN}}{P_{iT}}\right) - \Delta\ln\left(\frac{P_{jN}}{P_{jT}}\right)\right). \quad (6)$$

That is, movements in the real exchange rate may be separated into movements in the traded goods inflation differential (between states *i* and *j*), and movements in the relative (non-traded/traded)

[14] Finally, to the extent real exchange rate appreciation lowers competitiveness, our results provide one possible channel supporting the corporate downsizing findings in Cohen, Coval, and Malloy (2011).

inflation differential in the two locations. These correspond to the two bracketed terms on the right hand side of equation (6).

Empirically, we first construct traded, and non-traded, inflation indexes for each state using the traded/non-traded classification of goods and services presented in Appendix Table 3. In principle, according to the HBS intuition, all of the real exchange rate effects should be observed in relative non-traded prices, since by assumption, traded goods prices are set in ‘global’ (i.e., national) markets. However, Engel (1999) and many others after him, present strong evidence suggesting that deviations from the law of one price (the first term in brackets in equation 6) account for virtually all real exchange rate movements, i.e., HBS is irrelevant empirically. More recently, Parsley and Popper (2010), argue that the problem may be a disconnect between the theory and the data. In particular, building on work by Sanyal and Jones (1982), argue that all final consumer goods contain a significant non-traded component. This implies that the empirical distinction between traded/non-traded when focusing on final consumer prices, is “essentially irrelevant” since these final goods are not ‘traded goods’ in the HBS sense. Parsley and Popper show that this interpretation goes a long way toward explaining the paradox highlighted by Engel (1999).

With these caveats, our results for the traded goods real exchange rate are presented in Table 6, and those for non-traded goods relative prices are presented in Table 7. Noticeable immediately in Table 6 is the increase in the estimates for the real exchange rate response to a government spending shock. According to the estimates, a ten percent increase in state government spending causes a (traded goods) real exchange rate appreciation of about 4.7 percent, more than twice as large as the estimate for the overall real exchange rate, and the results are statistically significant at the one percent level; so even within the U.S., deviations from the law of one price in traded goods contribute strongly to real exchange rate movements. Additionally, the estimates in Table 6 suggest that if the income (productivity) growth differential increased by 10 percent, the traded goods real exchange rate would *depreciate* by about a half a percent. Though many studies find weak (e.g., only in the long-run), or little, support for HBS effects, relatively few, e.g., Gubler and Sax (2011) for the OECD countries, find a statistically significant negative relation. As in the results for the overall real exchange rate presented in Table 5, neither the coefficient estimate on the government budget surplus, nor that on budget surplus*spending shock interaction are statistically different from zero. As before, the size of the reported effects remains even accounting for the interaction terms, since the means of the right hand side variables are close to zero.

In Table 7, we focus on relative (across states) non-traded/traded price movements in response to a government spending shock, i.e., the second term in brackets in equation (6). The results here also seem surprising, and suggest that a 10 percent government spending shock is associated with a decline in the relative non-traded/traded goods prices. This is consistent with the large increase in traded goods prices, but is counter-intuitive. The HBS prediction that growth in productivity/income raises relative non-traded goods prices is strongly supported.

Recent studies have shown that the effects of government spending depend on whether such spending can be regarded as investment or as consumption, i.e., the composition of government spending matters, e.g., Lane and Perotti (2001), and, Galston and Lane (2009). Hence, in Tables 8 and 9, we attempt to distinguish between government investment shocks versus government consumption shocks. In principle, government investment could raise the productivity of either tradables, nontradables, or both, which leads (via a HBS channel) either to real exchange rate appreciation or depreciation, depending on the relative productivity movements. The real exchange rate prediction for government consumption shocks conforms to the standard prediction (appreciation) since government spending is typically assumed to be consumption. Benetrix and Lane (2013) find empirically that government investment shocks generate larger and more persistent real appreciations than shocks to government consumption.

To operationalize our tests, we use the actual fraction of each state's government spending (i.e., excluding any federal spending) in year *t* that went to capital outlays as the benchmark for investment, and assume the same fraction of federal-state transfers is also investment. This is clearly a simplifying assumption and presumes states have discretion when allocating federal spending across different objectives. To be clear, in Table 8 the assumed fraction of federal-state transfers classified as government consumption, is simply 1 minus the fraction classified as state government investment. Results presented in Tables 8 and 9 are consistent with these assumptions, i.e., government investment shocks are associated with appreciating real exchange rates, while the estimates of government consumption spending shocks are not statistically different from zero. Support for the HBS prediction that productivity growth appreciates the real exchange rate is found in both Tables 8 and 9.

V. Conclusions

This study provides estimates of the response of real exchange rates to fiscal policy. Despite there being reasonably widespread agreement from theory that the real exchange rate should appreciate following a fiscal stimulus, this prediction has been difficult to establish empirically.

Important challenges to research in this area include identifying exogenous fiscal shocks as well as controlling for endogenous monetary policy. In this study we address these challenges by using a unique set of shocks to the leadership of important U.S. congressional committees as an instrument for fiscal shocks.

The use of committee leadership changes to instrument exogenous fiscal shocks was recently proposed by Cohen, Coval, and Malloy (2011), who establish that leadership changes lead to significant changes in federal-state spending flows; positive flows to states with ascending chairs and decreases in federal spending in states losing a chair. Their study also finds that investment by private sector firms responds inversely to fiscal shocks. In contrast, this study takes a more macroeconomic perspective and focuses on the real exchange rate effects of such shocks. Employing their measure of congressional leadership changes, and in contrast to several recent studies, we find that exogenous fiscal stimulus causes real exchange rate appreciations. Our empirical findings are consistent with standard neo-classical and Keynesian model predictions for the response of real exchange rates to fiscal shocks.

In addition to the identification of fiscal shocks, our intra-national setting has several advantages over the more typical country-level studies of real exchange rates: first, U.S. states are at similar levels of economic development, and share similar institutions, higher capital- and labor-mobility, and low trade barriers[15]; second, and importantly, states are dollarized economies, i.e., nominal exchange rates are fixed, which implies there is no state-level monetary policy.

To examine the real exchange rate implications, we construct U.S. state-level price indexes from more than three million raw price observations spanning the period 1968-2011. By focusing on intra-U.S. real exchange rates and exogenous shocks to state-level federal fiscal expenditures, we avoid some significant econometric challenges (e.g., endogenous monetary policy, and Ricardian equivalence) which plague studies using observational data to study the effects of fiscal shocks.

Our IV results show that exogenous increases in government spending cause real exchange rate appreciations, consistent with simple Neo-Classical and Keynesian theories. In particular, a ten percent exogenous fiscal stimulus at home produces a real exchange rate appreciation of between 1.8, and 4.7 percent. Moreover, we find strong support for the Harrod-Balassa-Samuelson (HBS) implication that higher productivity/income growth leads to currency appreciation. This finding is

[15] Recently Ilzetzki et al (2013) find that fiscal multipliers vary by the level of development and by the actual exchange rate regime in place. This is a limitation of our findings, i.e., our results may not generalize to all country experiences.

in contrast to most studies using international data with flexible exchange rates, and supports the notion that currency volatility can obscure HBS effects in the data. We also find that the two components of a standard real exchange rate decomposition (traded goods real exchange rates, and non-traded goods relative prices) behave differently to government spending shocks, and the estimates of HBS effects are opposite. Finally, when government spending shocks are categorized into either government investment, or government consumption, we find that the largest effects on real exchange rates are government investment shocks.

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Figure 1

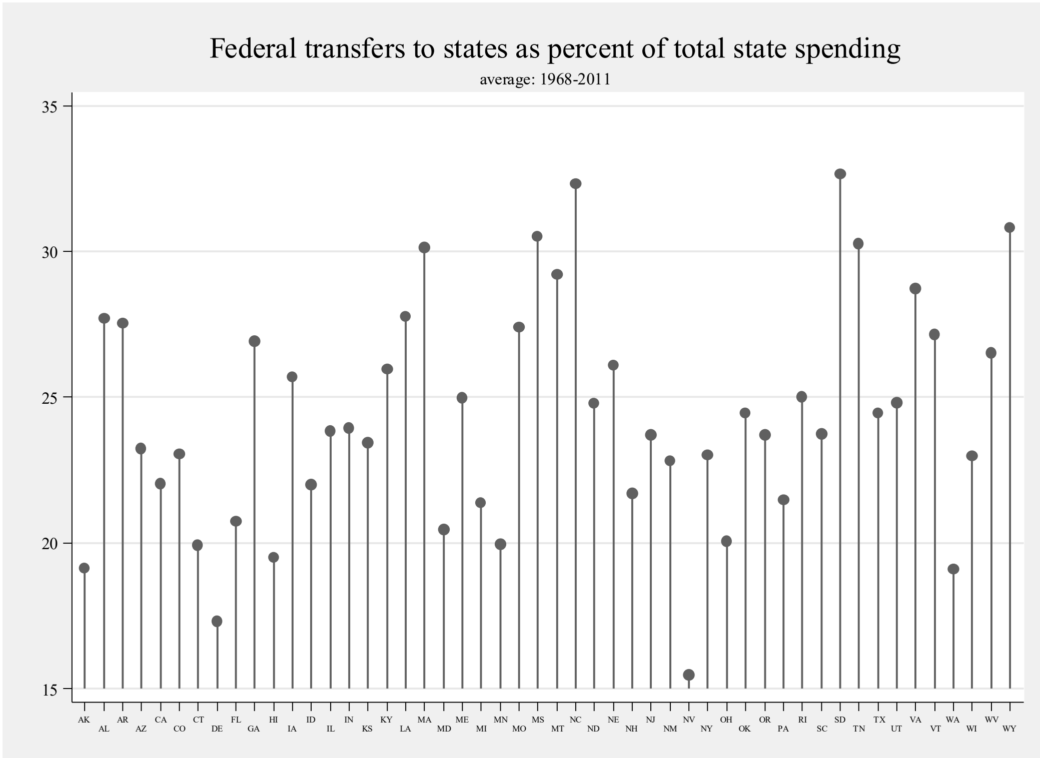


Figure 2

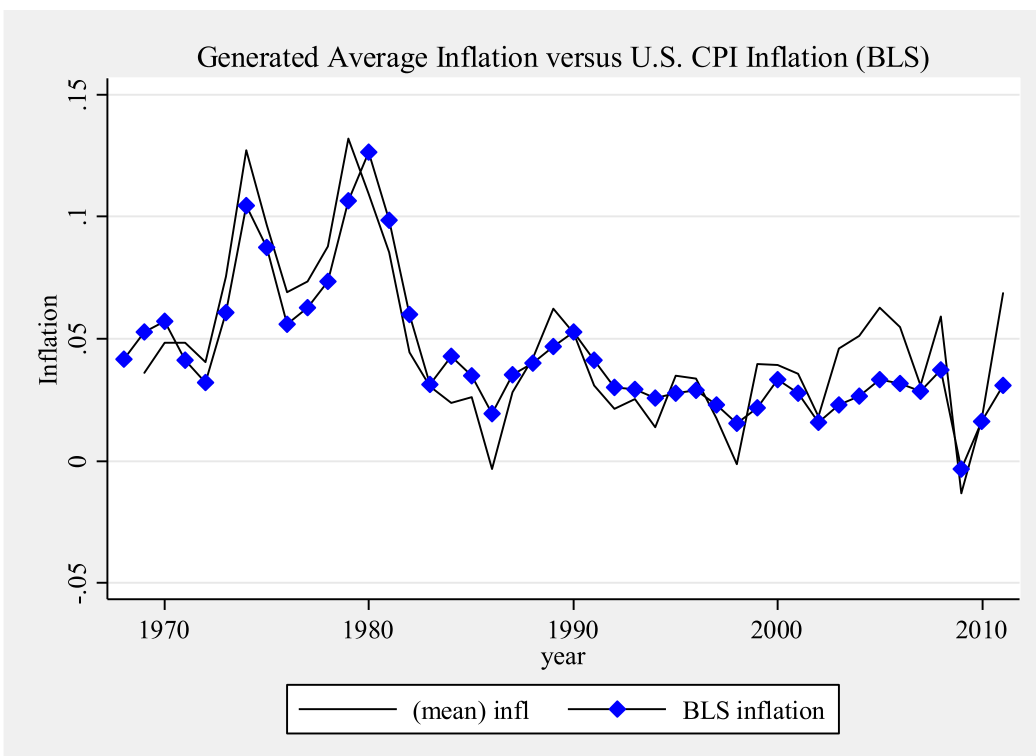
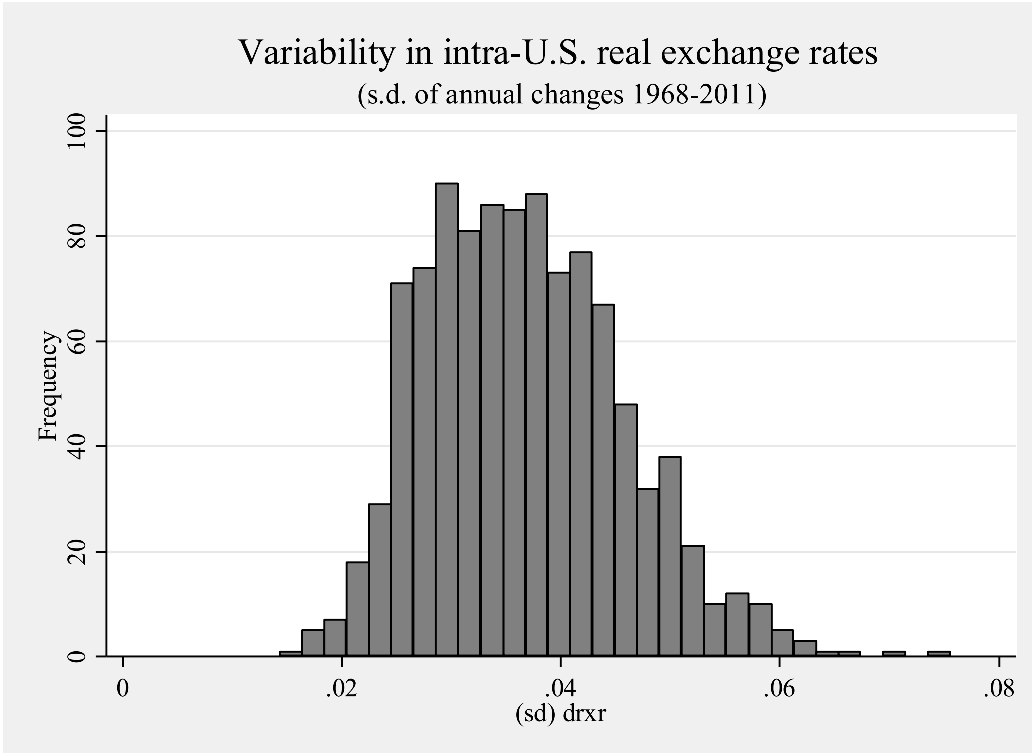


Figure 3



Variability in intra-U.S. real exchange rates
(s.d. of annual changes 1968-2011)
Frequency
0
20
40
60
80
100
0
.02
.04
.06
.08
(sd) drxr

Table 1: Top 2 cities, by state

	State	City	observations	City	observations
1	AK	Anchorage	117	Fairbanks	110
2	AL	Mobile	176	Huntsville	167
3	AR	Little Rock	131	Fort Smith	129
4	AZ	Tucson	157	Phoenix	123
5	CA	Riverside	174	Palm Springs	165
6	CO	Denver	177	Colorado Springs	172
7	CT	Hartford	80	New Haven	64
8	DE	Dover	104	Wilmington	96
9	FL	Orlando	141	Jacksonville	135
10	GA	Atlanta	142	Augusta	122
11	IA	Cedar Rapids	173	Des Moines	114
12	ID	Boise	151	Twin Falls	91
13	IL	Peoria	158	Springfield	153
14	IN	South Bend	161	Indianapolis	157
15	KS	Lawrence	142	Manhattan	115
16	KY	Louisville	177	Lexington	174
17	LA	Lake Charles	165	Baton Rouge	149
18	MA	Boston	93	Fitchburg-Leominster	75
19	MD	Baltimore	127	Hagerstown	79
20	ME	Portland	65	Lewiston	12
21	MI	Lansing	127	Benton Harbor	86
22	MN	Minneapolis	126	Saint Cloud	126
23	MO	Saint Louis	177	Columbia	167
24	MS	Jackson	118	Hattiesburg	79
25	MT	Great Falls	127	Billings	122
26	NC	Winston-Salem	168	Charlotte	153
27	ND	Fargo	122	Minot	84
28	NE	Omaha	176	Lincoln	153
29	NM	Albuquerque	135	Las Cruces	109
30	NV	Reno-Sparks	158	Las Vegas	122
31	NY	Buffalo	137	Binghamton	119
32	OH	Columbus	155	Cincinnati	147
33	OK	Tulsa	161	Oklahoma City	136
34	OR	Portland	164	Eugene	83
35	PA	York	166	Philadelphia	112
36	SC	Charleston	155	Greenville	147
37	SD	Vermillion	149	Sioux Falls	118
38	TN	Chattanooga	171	Knoxville	167
39	TX	Houston	175	Lubbock	174
40	UT	Salt Lake City	163	Cedar City	90
41	VA	Roanoke	149	Richmond	137
42	VT	Burlington-Chittenden Co	81	Barre	61
43	WA	Spokane	133	Tacoma	125
44	WI	Wausau	166	Green Bay	151
45	WV	Charleston	165	Huntington	105
46	WY	Cheyenne	114	Casper	110

Table 2: Distribution of Consumer Price Inflation data, by year

Year	# of States	Average	Maximum	Minimum
1969	29	0.0361	0.1100	-0.0159
1970	32	0.0487	0.1005	-0.0015
1971	35	0.0481	0.1289	-0.0032
1972	36	0.0348	0.1335	-0.0381
1973	41	0.0756	0.1526	-0.0315
1974	38	0.1321	0.2055	0.0390
1975	38	0.0961	0.1618	0.0118
1976	33	0.0676	0.1281	0.0201
1977	35	0.0723	0.1249	0.0071
1978	35	0.0888	0.1670	0.0014
1979	32	0.1395	0.1942	0.0554
1980	36	0.1098	0.2149	0.0191
1981	36	0.0836	0.2129	0.0212
1982	37	0.0443	0.0961	0.0065
1983	36	0.0305	0.0669	-0.0017
1984	37	0.0231	0.0936	-0.0373
1985	40	0.0266	0.0948	-0.0084
1986	41	-0.0035	0.0753	-0.0577
1987	41	0.0283	0.0717	-0.0153
1988	39	0.0422	0.1081	0.0025
1989	39	0.0630	0.1263	-0.0054
1990	41	0.0530	0.1170	-0.0628
1991	40	0.0306	0.0967	-0.0241
1992	44	0.0212	0.0832	-0.0563
1993	42	0.0240	0.0739	-0.0196
1994	44	0.0136	0.0501	-0.0340
1995	44	0.0350	0.1005	-0.0229
1996	44	0.0335	0.0783	-0.0103
1997	44	0.0165	0.0627	-0.0213
1998	43	-0.0031	0.0739	-0.0725
1999	45	0.0398	0.1231	0.0052
2000	44	0.0500	0.1185	0.0209
2001	44	0.0578	0.1237	-0.0044
2002	43	0.0171	0.0933	-0.0287
2003	42	0.0459	0.0874	-0.0352
2004	44	0.0515	0.1633	-0.0132
2005	41	0.0636	0.2282	-0.0112
2006	42	0.0546	0.1424	0.0164
2007	44	0.0299	0.0748	-0.0130
2008	44	0.0360	0.1307	0.0014
2009	42	0.0244	0.0772	-0.0087
2010	42	0.0026	0.0493	-0.0746
2011	42	0.0688	0.1967	0.0179

This table displays summary statistics for state-level consumer price inflation computed from available from the American Chamber of Commerce price data. See text for computation details.

Table 3: Distribution of Consumer Price Inflation data, by state

State	# of years	Avg Inflation	Minimum	Maximum
Alaska	29	0.0327	0.0822	0.8142
Alabama	42	0.0446	0.1473	0.8034
Arkansas	42	0.0486	0.1341	0.8900
Arizona	39	0.0448	0.1374	0.7705
California	42	0.0514	0.1908	0.8550
Colorado	43	0.0475	0.1771	0.8168
Connecticut	14	0.0355	0.1139	1.0705
Delaware	22	0.0358	0.1263	0.7957
Florida	35	0.0439	0.2055	0.9363
Georgia	36	0.0392	0.1170	0.9583
Iowa	43	0.0440	0.1469	0.8011
Idaho	40	0.0507	0.1325	0.8484
Illinois	42	0.0474	0.1717	0.8336
Indiana	43	0.0447	0.1663	0.8725
Kansas	39	0.0481	0.1386	0.8063
Kentucky	43	0.0492	0.1912	0.9198
Louisiana	41	0.0490	0.1928	0.9452
Massachusetts	19	0.0495	0.1967	0.9197
Maryland	36	0.0476	0.2129	1.0701
Maine	19	0.0480	0.1165	0.5652
Michigan	33	0.0474	0.1432	0.9024
Minnesota	36	0.0469	0.1450	0.9424
Missouri	42	0.0421	0.1942	1.0222
Mississippi	33	0.0448	0.1010	0.7055
Montana	34	0.0460	0.1648	0.9967
North Carolina	41	0.0481	0.1581	0.8382
North Dakota	30	0.0463	0.1751	0.9813
Nebraska	43	0.0459	0.1491	0.8187
New Mexico	38	0.0419	0.1335	0.9019
Nevada	39	0.0483	0.1553	0.8017
New York	35	0.0433	0.1625	0.8492
Ohio	43	0.0466	0.1496	0.7988
Oklahoma	43	0.0462	0.1414	0.9216
Oregon	39	0.0430	0.1026	0.7155
Pennsylvania	39	0.0590	0.2282	1.0327
South Carolina	42	0.0490	0.2033	0.8739
South Dakota	37	0.0494	0.1518	0.7494
Tennessee	42	0.0490	0.1825	0.8623
Texas	43	0.0456	0.1685	0.9103
Utah	43	0.0446	0.1641	1.0741
Virginia	38	0.0448	0.1681	0.9394
Vermont	29	0.0526	0.2149	0.9044
Washington	37	0.0402	0.1048	0.7254
Wisconsin	42	0.0469	0.1573	0.7635
West Virginia	39	0.0465	0.1618	0.8880
Wyoming	42	0.0495	0.1786	0.9146

This table displays summary statistics for state-level consumer price inflation computed from available from the American Chamber of Commerce price data. See text for computation details.

Table 4: The Impact of Fiscal Shocks on the Real Exchange Rate
(OLS Estimation)

VARIABLES	(1) Δq	(2) Δq	(3) Δq	(4) Δq	(5) Δq	(6) Δq
Federal Government Spending	0.00984***	0.01016***	0.00981***	0.00981***	0.00964***	0.00965***
	(0.00198)	(0.00201)	(0.00201)	(0.00201)	(0.00201)	(0.00201)
Per Capita Income Growth			0.10906***	0.10906***	0.10955***	0.10924***
			(0.00915)	(0.00916)	(0.00916)	(0.00918)
Federal Government Spending * Percapita Income Growth				-0.00023	-0.00960	-0.00965
				(0.09196)	(0.09186)	(0.09186)
Change in Government Budget Surplus (% GDP)					-0.06162***	-0.05918***
					(0.01942)	(0.01933)
Federal Government Spending * Change in Government Budget Surplus						-0.17061
						(0.16710)
Time Dummies	no	yes	yes	yes	yes	yes
Observations	33,484	33,484	33,484	33,484	33,484	33,484
r2	0.001	0.014	0.020	0.020	0.020	0.020
Number of statepair	1028	1028	1028	1028	1028	1,028

HAC robust s.e.'s. clustered by state-pair
*** p<0.01, ** p<0.05, * p<0.1
Dependent variable: Δq = Δln(Pi/Pj

Table 5: The Impact of Fiscal Shocks on the Real Exchange Rate
(IV estimation (2 step feasible GMM))

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Δq	Δq	Δq	Δq	Δq
Federal Government Spending	0.17387**	0.18046**	0.17967**	0.18065**	0.17810**
	(0.08134)	(0.08105)	(0.08136)	(0.08104)	(0.08072)
Per Capita Income Growth		0.08235***	0.08178***	0.08184***	0.08150***
		(0.01115)	(0.01126)	(0.01131)	(0.01129)
Federal Government Spending			0.51749*	0.51503*	0.50736*
* Percapita Income Growth			(0.28660)	(0.28920)	(0.28772)
Change in Government Budget Surplus				-0.02814	-0.02492
(% GDP)				(0.02902)	(0.02906)
Federal Government Spending					-0.25490
* Change in Government Budget Surpl					(0.22168)
Time Dummies	yes	yes	yes	yes	yes
Observations	29,681	29,681	29,681	29,681	29,681
Number of statepair	1028	1028	1028	1028	1028

HAC robust s.e.'s. clustered by state-pair
*** p<0.01, ** p<0.05, * p<0.1
Dependent variable: Δq = Δln(Pi/Pj

	(1)	(2)	(3)	(4)	(5)
Endogeneity	5.03	5.57	5.47	5.60	5.458
p-value	0.025	0.018	0.019	0.018	0.020
Weak Identification (Sanderson-Windmeijer)	14.30	14.42	14.42	14.56	14.66
Prob > F =	0.000	0.000	0.000	0.000	0.000
Underidentification (L-P LM statistic)	29.10	29.34	29.41	29.70	29.92
p-value	0.000	0.000	0.000	0.000	0.000

Table 6: The Impact of Fiscal Shocks on the Traded Goods Real Exchange Rate
(IV estimation (2 step feasible GMM))

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Δq(tgs)	Δq(tgs)	Δq(tgs)	Δq(tgs)	Δq(tgs)
Federal Government Spending	0.47589***	0.47238***	0.47467***	0.47361***	0.47017***
	(0.11742)	(0.11653)	(0.11707)	(0.11631)	(0.11565)
Per Capita Income Growth		-0.06248***	-0.06386***	-0.06401***	-0.06445***
		(0.01626)	(0.01656)	(0.01659)	(0.01655)
Federal Government Spending			1.25439***	1.26041***	1.24992***
* Percapita Income Growth			(0.44746)	(0.44971)	(0.44707)
Change in Government Budget Surplus				0.04865	0.05279
(% GDP)				(0.04520)	(0.04544)
Federal Government Spending					-0.33653
* Change in Government Budget Surpl					(0.46265)
Time Dummies	yes	yes	yes	yes	yes
Observations	29,756	29,756	29,756	29,756	29,756
Number of statepair	1028	1028	1028	1028	1028

HAC robust s.e.'s. clustered by state-pair
*** p<0.01, ** p<0.05, * p<0.1
Dependent variable: $\Delta q = \Delta \ln(Pi/Pj)$, traded goods

Endogeneity	35.43	35.09	35.11	35.37	35.01
p-value	0.000	0.000	0.000	0.000	0.000
Weak Identification (Sanderson-Windmeijer)	13.00	13.10	13.11	13.25	13.30
Prob > F =	0.000	0.000	0.000	0.000	0.000
Underidentification (L-P LM statistic)	26.26	26.45	26.51	26.81	26.91
p-value	0.000	0.000	0.000	0.000	0.000

Table 7: The Impact of Fiscal Shocks on Non-Traded Goods Relative Prices
(IV estimation (2 step feasible GMM))

VARIABLES	(1) Δq(ntgs)	(2) Δq(ntgs)	(3) Δq(ntgs)	(4) Δq(ntgs)	(5) Δq(ntgs)
Federal Government Spending	-0.33914**	-0.32363**	-0.32717**	-0.32623**	-0.33708**
	(0.15670)	(0.15428)	(0.15519)	(0.15435)	(0.15486)
Per Capita Income Growth		0.23471***	0.23576***	0.23580***	0.23436***
		(0.02231)	(0.02266)	(0.02270)	(0.02283)
Federal Government Spending * Percapita Income Growth			-0.92780*	-0.92880*	-0.96198*
			(0.52412)	(0.52806)	(0.53114)
Change in Government Budget Surplus (% GDP)				-0.02019	-0.00700
				(0.05621)	(0.05783)
Federal Government Spending * Change in Government Budget Surplus					-1.06410**
					(0.47227)
Time Dummies	yes	yes	yes	yes	yes
Observations	29,681	29,681	29,681	29,681	29,681
Number of statepair	1028	1028	1028	1028	1028

HAC robust s.e.'s. clustered by state-pair
*** p<0.01, ** p<0.05, * p<0.1
Dependent variable: Δq = Δln(Pi/Pj), non-traded goods

	(1)	(2)	(3)	(4)	(5)
Endogeneity	0.41	0.25	0.28	0.26	0.28
p-value	0.522	0.618	0.522	0.522	0.522
Weak Identification (Sanderson-Windmeijer)	13.27	13.37	13.41	13.54	13.58
Prob > F =	0.000	0.000	0.000	0.000	0.000
Underidentification (L-P LM statistic)	26.83	27.03	27.14	27.41	27.50
p-value	0.000	0.000	0.000	0.000	0.000

Table 8: The Impact of Fiscal Shocks on the Real Exchange Rate: Government Consumption

	IV estimation (2 step feasible GMM)				
	(1)	(2)	(3)	(4)	(5)
VARIABLES	Δq	Δq	Δq	Δq	Δq
Federal Government Spending	0.09227	0.09434	0.09136	0.09347	0.09132
	(0.08990)	(0.08953)	(0.08958)	(0.08924)	(0.08886)
Per Capita Income Growth		0.09491***	0.09462***	0.09485***	0.09431***
		(0.00928)	(0.00925)	(0.00926)	(0.00925)
Relative Federal Government Spending			0.23848	0.23511	0.22874
* Percapita Income Growth			(0.28762)	(0.29079)	(0.28952)
Change in Government Budget Surplus				-0.04984*	-0.04647
(% GDP)				(0.02959)	(0.02977)
Federal Government Spending					-0.26121
* Change in Government Budget Sur					(0.17323)
Time dummies	yes	yes	yes	yes	yes
Observations	29,681	29,681	29,681	29,681	29,681
Number of statepair	1028	1028	1028	1028	1028

HAC robust s.e.'s. clustered by state-pair

*** p<0.01, ** p<0.05, * p<0.1

Definition: Q = Pi/Pj

	(1)	(2)	(3)	(4)	(5)
Endogeneity	1.03	1.09	1.01	1.08	1.04
p-value	0.522	0.618	0.522	0.522	0.522
Weak Identification (K-P F-test)	11.10	11.09	11.16	11.25	11.30
15% maximal IV size	11.59	11.59	11.59	11.59	11.59
Underidentification (L-P LM statistic)	22.27	22.26	22.42	22.60	22.72
p-value	0.000	0.000	0.000	0.000	0.000

Table 9: The Impact of Fiscal Shocks on the Real Exchange Rate: Government Investment

	IV estimation (2 step feasible GMM)				
	(1)	(2)	(3)	(4)	(5)
VARIABLES	Δq	Δq	Δq	Δq	Δq
Federal Government Spending	0.07210***	0.07333***	0.07344***	0.07383***	0.07348***
	(0.02200)	(0.02153)	(0.02158)	(0.02159)	(0.02160)
Per Capita Income Growth		0.03932**	0.03907**	0.03914**	0.03905**
		(0.01875)	(0.01883)	(0.01883)	(0.01881)
Relative Federal Government Spending			0.15174	0.13874	0.13797
* Percapita Income Growth			(0.12945)	(0.12947)	(0.12937)
Change in Government Budget Surplus				-0.07361***	-0.07100***
(% GDP)				(0.02353)	(0.02334)
Federal Government Spending					-0.17309
* Change in Government Budget Sur					(0.19845)
Time dummies	yes	yes	yes	yes	yes
Observations	29,681	29,681	29,681	29,681	29,681
Number of statepair	1028	1028	1028	1028	1028

HAC robust s.e.'s. clustered by state-pair

*** p<0.01, ** p<0.05, * p<0.1

Definition: Q = Pi/Pj

	(1)	(2)	(3)	(4)	(5)
Endogeneity	10.92	12.20	12.19	12.34	12.19
p-value	0.001	0.001	0.001	0.000	0.001
Weak Identification (K-P F-test)	33.28	34.75	34.65	34.63	34.52
10% maximal IV size	19.93	19.93	19.93	19.93	19.93
Underidentification (L-P LM statistic)	66.14	66.93	68.76	68.72	68.52
p-value	0.000	0.000	0.000	0.000	0.000

APPENDIX TABLE 1: DESCRIPTIONS OF COMMODITIES INCLUDED

Item	Date added	Description
Antibiotic Ointment	94.4	½ oz. tube, Polysporin brand (94.4-02.4).
Apartment	68.1	Monthly rent (68.1-79.1); monthly rent, excl. all utilities except water, two bedrooms, one bath, unfurnished (79.2-81.4); monthly rent, excl. all utilities except water, two bedrooms, 1 or 1½ bath unit of approx. 950 sq. ft. (82.1-85.4); monthly rent, excl. all utilities except water, two bedrooms, unfurnished, 1 or 1½ baths, approx. 950 sq. ft. (86.1-88.3); monthly rent, excl. all utilities except water, two bedrooms, unfurnished, 1½ or 2 baths, approx. 950 sq. ft. (88.4-11.4).
Aspirin	82.1	Bayer brand, 100-tablet bottle (82.1-89.3); Bayer brand, 100-tablet bottle, 325-mg tablets (89.4-94.3).
Atorvastatin Calcium	05.1	20 mg. 30 tablets, Lipitor brand (05.1-11.4).
Automobile Registration	68.1	One year (68.1-68.4, 69.2-70.2).
Automobile Repair/Auto Maintenance	79.2	Spin balance of two front wheels (79.2-83.3); Spin balance of one front wheel (83.4-85.4); average price to balance one front wheel (86.1-88.3); average price to computer- or spin-balance one front wheel (88.4-11.4).
Baby Food	68.1	6 jars, Gerber's strained (68.1-69.4); 1 jar, Gerber's strained vegetables (70.1-81.4); 4 ½ oz. jar, Gerber's strained vegetables (82.1-83.3);4½ oz. jar, strained vegetables, lowest price (83.4-91.3); 4-4.5 oz. jar, strained vegetables, lowest price (91.4-98.3, 99.2, 99.4);4-4.5 oz. jar, strained fruit or vegetables, lowest price (98.4-99.1, 99.3, 00.1-03.4).
Bacon	68.1	lb., lowest price (68.1-85.4);price per pound, rashers, Oscar Mayer Hormel Black Label, Armour or Field's (86.1-88.3); 12 oz. package, rashers, Oscar Mayer, Hormel Black Label, or Field's (88.4-89.3); price per pound, Oscar Mayer, Hormel Black Label or Field's (89.4-90.3); price per pound, Oscar Mayer, Hormel Black Label or Bar-S (90.4-91.3).
Bananas	68.1	lb. (68.1-11.4).
Beauty Salon Visit	82.1	Woman's shampoo, trim and blow-dry (82.1-11.4).
Beer	82.1	6-pack, 12 oz. containers, excluding any deposit, Schlitz or Budweiser (82.1-89.3); 6-pack, 12 oz. containers, excluding any deposit, Budweiser or Miller Lite (89.4-99.4); 6-pack, 12 oz. containers, excluding any deposit, Heineken's (00.1-11.4).
Board Game/Child's Game	82.1	Parker Brothers' 'Monopoly', standard edition (82.1-83.3); Parker Brothers' 'Monopoly', No. 9 standard edition (83.4-02.4).

Bowling	68.1	Price per line (68.1-72.4); Price per line, evening prices (73.1-81.4); Price per line (game), evening rate (82.1-98.2, 99.2, 99.4); Price per line (game), Saturday evening non-league rate (98.3-99.1, 99.3, 00.1-11.4).
Boy's Jeans	05.1	Blue Denim Jeans, regular, relaxed or loose fit, sizes 8-20 (05.1-11.4).
Boy's Underwear	82.1	Fruit of the Loom brand, Package of 3 briefs (82.1-83.3); package of 3 cotton briefs (83.4-85.4); package of 3 cotton briefs, sizes range 28/30-34/36 (86.1-88.3); package of 3 briefs, cotton, lowest price (88.4-90.3); package of 3 briefs, size 10-14, cotton, lowest price (90.4-03.4); package of 6 briefs, size 10-14, cotton, lowest price (04.1-04.4).
Bread, white	68.1	20 oz., lowest price (68.1-80.2); 24 oz. loaf, lowest price (80.3-81.4, 83.4-90.3); 24 oz. loaf (82.1-83.3);24 oz. loaf, lowest price, or prorated 24 oz. equivalent, lowest price (90.4-11.4).
Bus Fare/Commuter Fare	68.1	Basic fare, 1 trip (68.1-81.4); one-way fare for commuting 10 miles to CBD (82.1-85.4); Typical one-way commuting fare, up to 10 miles (86.1-98.3, 99.2, 99.4); one-way commute, 10 miles (98.4-99.1, 99.3, 00.1-04.4).
Canola Oil	09.1	48 oz. bottle (09.1-11.4).
Cheese	82.1	Parmesan Cheese, grated, 8 oz. canister, Kraft (82.1-11.4).
Chunk Light Tuna	82.1	6.5 oz. can, Starkist or Chicken of the Sea, packed in oil (82.1-91.3); 6.125-6.5 oz. can, Starkist or Chicken of the Sea, packed in oil (91.4-93.1,93.4); 6.125 oz. can, Starkist or Chicken of the Sea (93.2-93.3, 94.1-95.3); 6-6.125 oz. can, Starkist or Chicken of the Sea (95.4-99.4); 6 oz. can, Starkist or Chicken of the Sea (00.1-09.4); 5 or 6 oz. can, Starkist or Chicken of the Sea (10.1-11.4).
Cigarettes	68.1	Carton, Winston, king-size (68.1-85.4); Carton, Winston, king-size, 85mm (86.1-94.3); Carton, Winston (Parliament in Canada), king-size, 85mm (94.4-03.4).
Coffee, vacuum packed	68.1	lb., Maxwell House (68.1-72.4); 2 lb., Maxwell House, Hills Bros., or Folgers (73.1-80.2); 1 lb. Maxwell House, Hills Bros., or Folgers (80.3-81.4); 1 can can, Maxwell House, Hills Bros., or Folgers (82.1-83.3); 1 lb. can, Maxwell House, Hills Bros., or Folgers (83.4-88.3); 13 oz. can, Maxwell House, Hills Brothers or Folgers (88.4-99.4);11.5 oz. can, Maxwell House, Hills Brothers or Folgers (00.1-11.4).
Corn, cream style	68.1	#303 can, lowest price (68.1-76.3); #303 can, 15-17 oz. lowest price (76.4-79.1).
Corn Flakes	79.2	12 oz. Kellogg's or Post Toasties (79.2-80.2); 18 oz. Kellogg's or Post Toasties (80.3-11.4).

Dentist, Office Visit	68.1	Teeth cleaning and inspection, no x-ray (68.1-78.3, 80.3-83.3); teeth cleaning and inspection, no x-ray, prevailing charge (78.4-80.2); teeth cleaning/inspection, no x-ray or fluoride treatment (83.4-89.3); American Dental Association procedures: 1110 adult teeth cleaning, and 0120 periodic oral examination (89.4-04.4); American Dental Association procedure 1110 adult teeth cleaning (05.1-11.4).
Dishwashing Powder	96.4	50 oz. Cascade dishwashing powder (96.4-00.4); 60 oz. Cascade dishwashing powder (01.1-02.3); 75 oz. Cascade dishwashing powder (02.4-11.4).
Doctor, Office Visit	68.1	General practitioner, prevailing charge (68.1-81.4); general practitioner, consultation fee (82.1-85.4); general practitioner, average charge (86.1-89.3); American Medical Association procedure: general practitioner's routine examination of established patient (89.4-11.4).
Dry Cleaning	68.1	Man's two-piece suit (68.1-79.1, 89.4-11.4); man's two-piece suit, cash & carry (79.2-85.4); man's two-piece suit, average price (86.1-89.3).
Eggs	68.1	Doz., Large, Grade A (68.1-11.4).
Electric Power	68.1	Average monthly bill (68.1-76.3); 12 month average bill (76.4-78.3); average monthly bill based on usage during preceding 12 months in house specified for item 'House Purchase' (78.4-79.1); average monthly bill based on usage during preceding 12 months in house specified for item 'House Purchase', Column A for all-electric homes, Column B for all other homes (79.2-11.4).
Fresh Orange Juice	04.1	64 oz. (1.89 liters) Tropicana or Florida Natural brand (04.1-10.4); 59 or 64 oz. Tropicana or Florida Natural brand (11.1-11.4).
Fried Chicken	82.1	Breast and drumstick, Church's, or Kentucky Fried Chicken if available (82.1-83.3); thigh and drumstick, no extras, Church's or Kentucky Fried Chicken if available (83.4-85.4); thigh and drumstick, with or without extras, Church's or Kentucky Fried Chicken, where available (86.1-90.3); thigh and drumstick, with or without extras, whichever is less expensive, Church's or Kentucky Fried Chicken, where available (90.4-11.4).
Frozen Corn	83.4	Whole kernel, 10 oz. package, lowest price (83.4-95.3); Whole kernel, 16 oz., lowest price (95.4-11.4).
Frozen Green Beans	80.3	10 oz. pkg., lowest price (80.3-81.4); 9 oz. pkg., lowest price (82.1-83.3).
Frozen Meal	04.1	8 to 10 oz. frozen chicken entrée, healthy choice or lean cuisine brand (04.1-11.4).
Frozen Orange Juice	68.1	6 pack, lowest price (68.1-69.4); 6 oz. can, lowest price (70.1-85.4); 12 oz. can, Minute Maid (86.1-03.4).
Frozen Peas	68.1	10 oz. pkg., lowest price (68.1-80.2).

Frying Chicken	68.1	Whole, lb., Grade A (68.1-78.3, 79.2-85.4); lb., Grade A (78.4-79.1); Whole fryer, price per pound (86.1-11.4).
Gasoline	68.1	Reg. grade, incl. taxes (68.1-72.4); Reg. grade, incl. taxes, national brands (73.1-76.3); Reg. grade, incl. taxes, national brands-full service (76.4-78.3); Gallon, reg. grade, incl. taxes, national brands-full service (78.4-79.1); Gallon, unleaded, incl. taxes, national brands-full service (79.2-81.4); 1 gal. unleaded regular, national brand, incl. all taxes, at self-service pump if available (82.1-11.4).
Green Beans	68.1	#303 can, lowest price (68.1-76.3); #303 can, 15-17 oz. lowest price (76.4-80.2).
Ground Beef	68.1	Ground Beef: lb. (68.1-72.4). Ground Beef or Hamburger: lb. (73.1-78.2); lb., lowest price (78.3-04.4); lb., lowest price, min 80% lean (05.1-11.4).
Hamburger Sandwich	82.1	½ lb. patty, McDonald's if available (82.1-83.1); $^{1}/_{4}$ lb. patty, McDonald's if available (83.2-85.4); $^{1}/_{4}$ lb. patty with cheese, McDonald's Quarter-Pounder with cheese, where available (86.1-90.3); $^{1}/_{4}$ lb. patty with cheese, pickle, onion, mustard and catsup, McDonald's Quarter-Pounder with cheese, where available (90.4-11.4).
Hospital Room	68.1	Semi-private, cost per day (68.1-99.4); private room, average cost per day (00.1-03.4).
House Purchase, Monthly Payment	68.1	Monthly payment (68.1-79.1); principal and interest only, new 1800 sq. ft. living area home, 25-year first mortgage on 25% down payment (79.2-81.4); principal and interest, new 1800 sq. ft. living area home, 25-year first mortgage on 25% down payment and current conventional fixed-rate of interest or adjustable rate mortgage plan (82.1-85.4); principal and interest, 25-year first mortgage based on 75% loan at current conventional fixed-rate of interest or adjustable rate mortgage plan (86.1-88.3); principal and interest, 30-year first mortgage based on 75% loan at current conventional fixed-rate of interest or adjustable rate mortgage plan (88.4-89.3); principal and interest, using mortgage rate from Item 'House Purchase, Mortgage Rate' and assuming 25% down payment (89.4-11.4).
House Purchase, Total Sales Price	82.1	1800 sq. ft. living area new house (82.1-85.4); 1800 sq. ft. living area new house, approx. 10,000 sq. ft. lot, urban area with all utilities (86.1-88.3); 1800 sq. ft. living area new house, approx. 8,000 sq. ft. lot, urban area with all utilities (88.4-99.4); 2400 sq. ft. living area new house, approx. 8,000 sq. ft. lot, urban area with all utilities (00.1-07.4);2400 sq. ft. living area new house, 8,000 sq. ft. lot, 4 bedrooms, 2 baths (08.1-11.4).
House Purchase, Mortgage Rate	89.4	Effective rate, including points and origination fee, for 30-year conventional fixed- or adjustable-rate mortgage (89.4-94.3);

		Effective rate, including points and origination fee, for 30-year(5-year in Canada) conventional fixed-rate mortgage (94.4-06.4); Effective rate, including points and origination fee, for 30-year (07.1-11.4).
Ibuprofen	03.1	200 mg. 50 tablets, Advil Tablets (03.1-08.4, 11.1-11.4); 200 mg. 100 tablets, Advil Tablets (09.1-10.4).
Jeans	82.1	Adult Denim Jeans: Levi's, straight leg (82.1-83.3); Levi's, straight leg, size 28/30 to 34/36 (83.4-85.4). Man's Denim Jeans: Levi's, straight leg, size 28/30 to 34/36 (86.1-87.3); Levi's, 501, size 28/30 to 34/36 (87.4-88.3); Levi's, 500, size 28/30 to 34/36 (88.4-89.3); Levi's, lowest price, 500, size 28/30 to 34/36 (89.4-91.3); Levi's, 501s or 505s, size 28/30 to 34/36 (91.4); Levi's, 501s or 505s, rinsed or washed or bleached, size 28/30 to 34/36 (92.1-99.4).
Lettuce	68.1	Head Lettuce, each (68.1-78.2); Head Lettuce, head, approx. 1 $^{1}/_{4}$ lb. (78.3, 79.2-88.3, 89.4-90.3); Lettuce, head, approx. 1 $^{1}/_{2}$ lb. (78.4-79.1); Iceberg Lettuce, head, approx.1 $^{1}/_{4}$ pound (88.4-89.3, 90.4-11.4).
Liquor	68.1	Fifth, Seagram's 7-Crown (68.1-78.3); 750 ml. Seagram's 7 Crown (78.4-88.3); J&B Scotch, 1 liter bottle (88.4-89.3); J&B Scotch, 750ml bottle (89.4-04.4).
Major Appliance Repair	79.2	Home service call, clothes washing machine, minimum service charge (79.2-83.3); Home service call, clothes washing machine, minimum labor charge, excl. any parts (83.4-11.4).
Man's Dress Shirt	82.1	Arrow or Van Heusen, white, long sleeve, cotton/polyester blend (82.1-83.3); Arrow, Enro or Van Heusen, white, long sleeve, cotton/polyester blend, size 15/32 to 16/34 (83.4-85.4); Arrow, Enro, Sear's Best or Van Heusen, white, long sleeve, cotton/polyester blend, size 15/32 to 16/34 (86.1-88.3);Arrow, Enro, Sear's Best or Van Heusen, white, cotton/poly blend, at least 55% cotton, long sleeves, size 15/32-16/34 (88.4-89.3); Arrow, Enro, Van Heusen, or J.C. Penney's Stafford, white, cotton/poly blend, at least 55% cotton, long sleeves (89.4-94.3); 100% cotton pinpoint Oxford, long sleeves (94.4-99.4); cotton/polyester, pinpoint weave, long sleeves (00.1-11.4).
Man's Haircut	68.1	Prevailing price (68.1-79.1); Barbershop, average price, no styling (79.2-81.4); Barbershop, basic haircut, no styling (82.1-11.4).
Man's Slacks	00.1	Dockers 'No Wrinkles' khakis, size 28/30-34/36 (00.1-02.4).
Margarine	68.1	lb., lowest price (68.1-85.4); 1 lb. Blue Bonnet or Parkay (86.1-90.3); one pound, cubes, Blue Bonnet or Parkay (90.4-11.4).
Movie	68.1	Downtown, indoor, evening (68.1-78.3); First-run indoor evening (78.4-90.3); First-run indoor evening, no discount (90.4-11.4).

Natural Gas/Other Energy	68.1	Natural Gas: Average monthly bill (68.1-76.3); 12 month average bill (76.4-78.3); average monthly bill based on usage during preceding 12 months in house specified for item 'House Purchase' (78.4-80.2); Other Fuel Sources-oil, natural gas, wood, etc./Other Home Energy: Average monthly bill based on usage during preceding 12 months in house specified for item 'House Purchase' (80.3-11.4).
Newspaper Subscription	82.1	Home delivery monthly cost for daily and Sunday (82.1-83.3); Home delivery monthly cost for daily and Sunday, large city newspaper (83.4-11.4).
Optometrist, Office Visit	04.1	Full vision eye exam for established adult patient (04.1-11.4).
Peaches	68.1	Halves, #2 can, lowest price (68.1-70.1); Halves, #2 ½ can, lowest price (70.2-76.3); Halves, #2 ½ can, approx. 29 oz. lowest price (76.4-85.4); Halves, 29 oz. can, Hunt's, Del Monte or Libby's (86.1-88.3); Halves or slices, 29 oz. can, Hunt's, Del Monte or Libby's (88.4-94.3); Halves or slices, 29 oz. can, Hunt's, Del Monte or Libby's(house brand in Canada) (94.4-99.4); Halves or slices, 29 oz. can, Hunt's, Del Monte, Lady Alberta or Libby's (00.1-07.4);29 oz. can, Hunt's, Del Monte, Lady Alberta or Libby's (08.1-11.4).
Peas, garden	68.1	#303 can, lowest price (68.1-76.3); #303 can, 15-17 oz. lowest price (76.4-79.1).
Pizza	82.1	12''-13'' thin crust, regular cheese, Pizza Hut, Pizza Inn or Shakey's, if available (82.1-88.3); 12''-13'' thin crust cheese pizza, Pizza Hut or Pizza Inn where available (88.4-94.3);11''-12'' thin crust cheese pizza, Pizza Hut or Pizza Inn where available (94.4-11.4).
Potatoes	68.1	10 lbs., white or red (68.1-81.4, 89.4-98.3, 99.2, 99.4-09.4); 10 lb. sack, white or red, lowest price (82.1-89.3); 1 white or red (98.4-99.1, 99.3); 5 lbs., white or red (10.1-11.4).
Potato Chips	04.1	12 oz. plain regular potato chips (04.1-11.4).
Sausage	91.4	Price per pound, Jimmy Dean pure pork sausage (91.4-99.4); Price per pound, Jimmy Dean or Owens brand, 100% pork (00.1-11.4).
Shampoo	82.1	11 oz. container, Johnson's Baby Shampoo (82.1-88.3, 89.4-90.4, 91.2); 15 oz. bottle, Johnson's Baby Shampoo (88.4-89.3, 91.1, 91.3); 15 oz. bottle, Alberto VO-5 (91.4-11.4).
Shortening	68.1	3 lb. can, Crisco (68.1-83.3); 3 lb. can, all vegetable, Crisco brand (83.4-08.4).
Soft Drink	68.1	8 pack, 16oz., Coca-Cola (68.1-69.4); 6 pack, 12oz. cans 7-up (70.1-72.4); 6 pack, 12oz. cans 7-up, Coca Cola, or Pepsi Cola (73.1-74.1); 1 qt. Ginger Ale, 32 oz., lowest price (74.2-75.3);1 qt.

		Coca-Cola, 32 oz. (75.4-78.2); 1 qt. Coca-Cola, 32 oz. or 1 liter, returnable bottle, excl. deposit (78.3-79.1); 2 liter Coca-Cola, excl. deposit if any (79.2-11.4).
Steak	68.1	Round Steak: lb., USDA Choice (68.1-80.2). T-bone Steak: lb., USDA Choice (80.3-91.3); price per pound, lowest price (91.4); price per pound (92.1-11.4).
Sugar	79.2	5 lbs. cane or beet, lowest price (79.2-92.3); 4 lbs. cane or beet, lowest price (92.4-11.4).
Sweet Peas	80.3	#303 can, 15-17 oz. lowest price (80.3-85.4); 17 oz. can, Del Monte or Green Giant (86.1-91.4); 15-17 oz. can, Del Monte or Green Giant (92.1-06.2); 15-15.25 oz. can, Del Monte or Green Giant (06.3-11.4).
Taxi Fare	68.1	First two miles (68.1-81.4).
Telephone	68.1	Private line, monthly rate (68.1-78.3); private residential line, monthly rate (78.4-80.2); private residential line, monthly rate plus est. local usage charges, if any, incurred by a family of four (80.3-81.4); private residential line, 2 standard instruments, monthly rate plus est. local usage charges, if any, incurred by a family of four (82.1-83.3); private residential line, customer owns instruments, monthly rate plus: est. local usage charges, if any, incurred by a family of four, federal excise tax, any base charges and access charges to long distance (83.4-85.4); private residential line, customer owns instruments, basic monthly rate plus: additional local use charges, if any, incurred by a family of four, Touch-Tone fee, other mandatory monthly charges, such as long distance access fee or 911 fee, and all taxes on the foregoing (86.1-11.4).
Tennis balls	82.1	Wilson or Penn brands, yellow, can of 3 extra-duty (82.1-11.4).
Tissue	68.1	Toilet Tissue: 4 pack, Scott (68.1-69.4); 1 roll, Scott (70.1-72.4); 1 roll, Scott, 1000 sheets (73.1-74.1); 1 roll, lowest price (74.2-78.2); 1 roll of 4-pack lowest price (78.3); 1 roll of 4-pack, national brand, lowest price (78.4-79.1); 4-pack, two-ply, national brand, lowest price (79.2-80.2); Facial Tissue: Kleenex brand, 200 count box (80.3-83.3, 06.3-11.4); Kleenex brand, 175 count box (83.4-02.3); Kleenex brand, 160-count box (02.4-06.2);.
Tomatoes	68.1	#303 can, lowest price (68.1-76.3); #303 can, 15-17 oz. (76.4-85.4); 14.5 oz. can, Hunt's or Del Monte (86.1-04.4).
Toothpaste	82.1	6 to 7 oz. tube, Crest or Colgate (82.1-06.2); 6 to 6.4 oz. tube, Crest or Colgate (06.3-11.4).

TV Repair	68.1	Service call, excl. parts (68.1-72.4); Service call, excl. parts B&W (73.1-74.1); Service call, excl. parts, color (74.2-79.1).
Veterinary Services	03.1	Annual exam, 4-year-old-dog (03.1-11.4).
Washing Powder	68.1	Giant, Tide (68.1-72.4); Giant, Tide, 49 oz. or equivalent brand & size (73.1-80.2); Giant size, 49 oz. Tide, Bold or Cheer (80.3-85.4); 42 oz. or 49 oz. Tide, Bold or Cheer (86.1-88.3); 42 oz. Tide, Bold or Cheer (88.4-90.3); 39 oz., Tide, Bold or Cheer (90.4-91.3); 42 oz. Tide, Bold, or Cheer 'Ultra' (91.4-96.3).
Whole Milk	68.1	Fresh, ½ gal., carton (68.1-83.3); ½ gal. carton, homogenized (83.4-85.4);½ gal. carton (86.1-11.4).
Wine	82.1	Paul Masson Chablis 750 milliliter bottle (82.1-83.3); Paul Masson Chablis 1.5 liter bottle (83.4-90.3); Gallo Sauvignon Blanc, 1.5-liter bottle (90.4-91.3); Gallo Chablis Blanc, 1.5-liter bottle (91.4-97.3); Livingston Cellars or Gallo Chablis blanc, 1.5-liter bottle (97.4-00.4); Livingston Cellars or Gallo Chablis or Chenin blanc, 1.5-liter bottle (01.1-10.4); Chablis or Chenin blanc or any white table wine, 1.5-liter bottle (11.1-11.4).
Woman's Shampoo & Set	68.1	Prevailing price (68.1-79.1); average price (79.2-81.4).
Women's Slacks	03.1	100% cotton, twill khakis, misses 4-14 (03.1-05.3); At least 95% cotton, twill khakis, misses 4-14 (05.4-11.4).

APPENDIX TABLE 2: COMMITTEE CHAIR CHANGES, BY STATE (1966-present)

	Senate		House	
State	**Ascensions**	**Departures**	**Ascensions**	**Departures**
California	4	3	16	14
Michigan	3	2	9	6
New York	2	1	9	8
Texas	2	2	9	8
Florida	3	3	7	6
West Virginia	9	9	1	1
Arizona	7	7	1	1
Mississippi	5	5	3	3
South Carolina	6	6	2	2
Alaska	6	6	1	1
Indiana	4	4	3	3
Oregon	6	5	1	1
Pennsylvania	5	5	2	2
Virginia	4	4	2	1
Delaware	5	5	0	0
Illinois	1	1	4	4
Kentucky	3	3	2	1
Louisiana	2	2	3	3
Massachusetts	2	2	3	3
Wisconsin	0	0	5	5
Alabama	3	3	1	1
Vermont	4	2	0	0
Washington	4	3	0	0
Arkansas	2	2	1	1
Georgia	3	3	0	0
Kansas	2	2	1	1
Maryland	2	1	1	1
Minnesota	1	1	2	2
Missouri	1	1	2	2
Montana	3	3	0	0
New Mexico	3	3	0	0
North Carolina	3	3	0	0
North Dakota	3	3	0	0
Oklahoma	2	2	1	1
Utah	3	3	0	0
Connecticut	2	2	0	0
Idaho	2	2	0	0
Iowa	2	2	0	0
Nevada	2	2	0	0
Wyoming	2	2	0	0
Maine	1	1	0	0
Ohio	0	0	1	1
South Dakota	1	1	0	0
Tennessee	1	1	0	0
Colorado	0	0	0	0
Nebraska	0	0	0	0

Appendix 3: U.S. Senate Committee Chairs

Committee	Chair	state	Assignment year	Years held
Appropriations	Hayden, Carl	AZ	1968	1
	Russell, Richard B.	GA	1969	2
	Ellender, Allen J.	LA	1971	1
	McClellan, John L.	AR	1972	5
	Magnuson, Warren G.	WA	1977	4
	Hatfield, Mark O.	OR	1981	6
	Stennis, John C.	MS	1987	2
	Byrd, Robert C.	WV	1989	6
	Hatfield, Mark O.	OR	1995	2
	Stevens, Ted	AK	1997	4
	Byrd, Robert C.	WV	2001	0
	Stevens, Ted	AK	2001	0
	Byrd, Robert C.	WV	2001	2
	Stevens, Ted	AK	2003	2
	Cochran, Thad	MS	2005	2
	Byrd, Robert C.	WV	2007	2
	Inouye, Daniel K.	HI	2009	2
Armed Services	Russell, Richard B.	GA	1968	1
	Stennis, John C.	MS	1969	12
	Tower, John G.	TX	1981	4
	Goldwater, Barry M.	AZ	1985	2
	Nunn, Samuel A.	GA	1987	8
	Thurmond, Strom	SC	1995	4
	Warner, John W.	VA	1999	2
	Levin, Carl	MI	2001	0
	Warner, John W.	VA	2001	0
	Levin, Carl	MI	2001	2
	Warner, John W.	VA	2003	4
	Levin, Carl	MI	2007	4
Budget	Muskie, Edmund S.	ME	1974	6
	Hollings, Ernest F.	SC	1980	1
	Domenici, Pete V.	NM	1981	6
	Chiles, Lawton M. Jr.	FL	1987	2
	Sasser, James R.	TN	1989	6
	Domenici, Pete V.	NM	1995	6
	Conrad, Kent	ND	2001	0
	Domenici, Pete V.	NM	2001	0
	Conrad, Kent	ND	2001	2
	Nickles, Don	OK	2003	2
	Gregg, Judd	NH	2005	2
	Conrad, Kent	ND	2007	4
Commerce	Magnuson, Warren G.	WA	1968	10
	Cannon, Howard W.	NV	1978	3
	Packwood, Robert W.	OR	1981	4
	Danforth, John C.	MO	1985	2
	Hollings, Ernest F.	SC	1987	8
	Pressler, Larry	SD	1995	2
	McCain, John	AZ	1997	4
	Hollings, Ernest F.	SC	2001	0
	McCain, John	AZ	2001	0
	Hollings, Ernest F.	SC	2001	2
	McCain, John	AZ	2003	2
	Stevens, Ted	AK	2005	2
	Inouye, Daniel K.	HI	2007	2
	Rockefeller, John D., IV	WV	2009	2
Finance	Long, Russell B.	LA	1968	13
	Dole, Robert J.	KS	1981	4
	Packwood, Robert W.	OR	1985	2
	Bentsen, Lloyd M. Jr.	TX	1987	6
	Moynihan, Daniel P.	NY	1993	2
	Packwood, Robert W.	OR	1995	0
	Roth, William V., Jr.	DE	1995	6
	Baucus, Max	MT	2001	0
	Grassley, Charles E.	IA	2001	0
	Baucus, Max	MT	2001	2
	Grassley, Charles E.	IA	2003	4
	Baucus, Max	MT	2007	4

Committee	Chair	state	Assignment year	Years held
Foreign Relations	Fulbright, J. William	AR	1968	7
	Sparkman, John J.	AL	1975	4
	Church, Frank F.	ID	1979	2
	Percy, Charles H.	IL	1981	4
	Lugar, Richard G.	IN	1985	2
	Pell, Claiborne D.	RI	1987	8
	Helms, Jesse	NC	1995	6
	Biden, Joseph R., Jr.	DE	2001	0
	Helms, Jesse	NC	2001	0
	Biden, Joseph R., Jr.	DE	2001	2
	Lugar, Richard G.	IN	2003	4
	Biden, Joseph R., Jr.	DE	2007	2
	Kerry, John F.	MA	2009	2
Judiciary	Eastland, James O.	MS	1968	11
	Kennedy, Edward M.	MA	1979	2
	Thurmond, J. Strom	SC	1981	6
	Biden, Joseph R. Jr.	DE	1987	8
	Hatch, Orrin G.	UT	1995	6
	Leahy, Patrick J.	VT	2001	0
	Hatch, Orrin G.	UT	2001	0
	Leahy, Patrick J.	VT	2001	2
	Hatch, Orrin G.	UT	2003	2
	Specter, Arlen	PA	2005	2
	Leahy, Patrick J.	VT	2007	4
Rules	Jordan, B. Everett	NC	1968	5
	Cannon, Howard W.	NV	1973	4
	Pell, Claiborne D.	RI	1977	4
	Mathias, Charles McC. Jr.	MD	1981	6
	Ford, Wendell H.	KY	1987	8
	Stevens, Ted	AK	1995	0
	Warner, John W.	VA	1995	4
	McConnell, Mitch	KY	1999	2
	Dodd, Christopher, J	CT	2001	0
	McConnell, Mitch	KY	2001	0
	Dodd, Christopher, J	CT	2001	2
	Lott, Trent	MS	2003	4
	Feinstein, Dianne	CA	2007	2
	Schumer, Charles Ellis (Chuck)	NY	2009	2
Veterans	Hartke, R. Vance	IN	1971	6
	Cranston, Alan	CA	1977	4
	Simpson, Alan K.	WY	1981	4
	Murkowski, Frank H.	AK	1985	2
	Cranston, Alan	CA	1987	6
	Rockefeller, John D., IV	WV	1993	2
	Simpson, Alan K.	WY	1995	2
	Specter, Arlen	PA	1997	4
	Rockefeller, John D., IV	WV	2001	0
	Specter, Arlen	PA	2001	0
	Rockefeller, John D., IV	WV	2001	2
	Specter, Arlen	PA	2003	2
	Craig, Larry E.	ID	2005	2
	Akaka, Daniel K.	HI	2007	4
	Patty Murray	WA	2011	0
Intelligence	Frank Church	ID	1975	0
	Daniel Inouye	HI	1975	4
	Birch Bayh	IN	1979	2
	Barry Goldwater	AZ	1981	4
	David Durenberger	MN	1985	2
	David Boren	OK	1987	6
	Dennis DeConcini	AZ	1993	2
	Specter, Arlen	PA	1995	2
	Shelby, Richard C.	AL	1997	4
	Graham, Bob	FL	2001	0
	Shelby, Richard C.	AL	2001	0
	Graham, Bob	FL	2001	2
	Roberts, Pat	KS	2003	4
	Rockefeller, John D., IV	WV	2007	2
	Feinstein, Dianne	CA	2009	2

Appendix Table 4: U.S. House Committee Chairs

Committee	Chair	state	Assignment year	Years held
Appropriations	Mahon, George H.	TX	1968	11
	Whitten, Jamie L.	MS	1979	14
	Natcher, William H.	KY	1993	1
	Obey, David R.	WI	1994	1
	Livingston, Robert L.	LA	1995	4
	Young, C.W. Bill	FL	1999	6
	Lewis, Jerry	CA	2005	2
	Obey, David R.	WI	2007	4
	Rogers, Harold	KY	2011	0
Armed	Rivers, L. Mendel	SC	1968	1
Services	Philbin, Philip J.	MA	1969	0
	Rivers, L. Mendel	SC	1969	2
	Hebert, F. Edward	LA	1971	4
	Price, C. Melvin	IL	1975	10
	Aspin, Les	WI	1985	8
	Dellums, Ronald V.	CA	1993	2
	Spence, Floyd D.	SC	1995	6
	Stump, Robert	AZ	2001	2
	Hunter, Duncan L.	CA	2003	4
	Skelton, Ike	MO	2007	4
	McKeon, Howard P. (Buck)	CA	2011	0
Energy	Staggers, Harley O.	WV	1968	13
and Commerce	Dingell, John D. Jr.	MI	1981	12
	Dingell, John D., Jr.	MI	1993	2
	Bliley, Thomas J., Jr.	VA	1995	6
	Tauzin, W. J. (Billy)	LA	2001	4
	Barton, Joe L.	TX	2005	2
	Dingell, John D., Jr.	MI	2007	2
	Waxman, Henry A.	CA	2009	2
	Upton, Frederick S.	MI	2011	0
Foreign	Morgan, Thomas E.	PA	1968	9
Affairs	Zablocki, Clement J.	WI	1977	6
	Fascell, Dante B.	FL	1983	0
	Zablocki, Clement J.	WI	1983	0
	Fascell, Dante B.	FL	1983	10
	Hamilton, Lee H.	IN	1993	2
	Gilman, Benjamin A.	NY	1995	6
	Hyde, Henry J.	IL	2001	6
	Berman, Howard L.	CA	2007	0
	Lantos, Tom	CA	2007	1
	Berman, Howard L.	CA	2008	3
	Ros-Lehtinen, Ileana	FL	2011	0
Judiciary	Celler, Emanuel	NY	1968	5
	Rodino, Peter W. Jr.	NJ	1973	16
	Brooks, Jack B.	TX	1989	6
	Hyde, Henry J.	IL	1995	6
	Sensenbrenner, F. James, Jr.	WI	2001	6
	Conyers, John, Jr.	MI	2007	4
	Smith, Lamar S.	TX	2011	0

Committee	Chair	state	Assignment year	Years held
Transportation	Fallon, George H.	MD	1968	3
	Blatnik, John A.	MN	1971	4
	Jones, Robert E. Jr.	AL	1975	2
	Johnson, Harold T.	CA	1977	4
	Howard, James J.	NJ	1981	12
	Mineta, Norman Y.	CA	1993	2
	Shuster, Bud	PA	1995	6
	Young, Donald E.	AK	2001	6
	Oberstar, James L.	MN	2007	4
	Mica, John L.	FL	2011	0
Rules	Colmer, William M.	MS	1968	5
	Madden, Ray J.	IN	1973	4
	Delaney, James J.	NY	1977	2
	Bolling, Richard W.	MO	1979	4
	Pepper, Claude D.	FL	1983	6
	Moakley, John Joseph	MA	1989	6
	Solomon, Gerald B.H.	NY	1995	4
	Dreier, David	CA	1999	8
	Slaughter, Louise M.	NY	2007	4
	Dreier, David	CA	2011	0
Ways	Mills, Wilbur D.	AR	1968	5
and Means	Ullman, Albert C.	OR	1973	8
	Rostenkowski, Daniel D.	IL	1981	13
	Gibbons, Sam	FL	1994	1
	Archer, Bill	TX	1995	6
	Thomas, William M.	CA	2001	6
	Rangel, Charles B.	NY	2007	3
	Levin, Sander M.	MI	2010	1
	Camp, Dave	MI	2011	0
Intelligence	Lucien N. Nedzi	MI	1975	0
	Otis G. Pike	NY	1975	2
	Edward P. Boland	MA	1977	10
	Louis Stokes	OH	1987	2
	Anthony C Beilenson	CA	1989	2
	David McCurdy	OK	1991	2
	Glickman, Daniel R.	KS	1993	2
	Combest, Larry	TX	1995	2
	Goss, Porter J.	FL	1997	8
	Hoekstra, Peter	MI	2005	2
	Reyes, Silvestre	TX	2007	4
	Rogers, Mike	MI	2011	0
Homeland	Armey, Richard K.	TX	2002	1
Security	Cox, C. Christopher	CA	2003	4
	Thompson, Bennie	MS	2007	4
	King, Peter T.	NY	2011	0

Appendix Table 5: U.S. States with Concurrent Committee Chairs

	Year	State	Branch	Committee	Chair	Years held
1	1971	LA	Senate	Appropriations	Ellender, Allen J.	2
			House	Armed Services	Hebert, F. Edward	2
2	1975	AL	Senate	Foreign Relations	Sparkman, John J.	7
			House	Transportation	Jones, Robert E. Jr.	4
3	1977	CA	Senate	Veterans	Cranston, Alan	6
			House	Transportation	Johnson, Harold T.	2
4	1981	IL	Senate	Foreign Relations	Percy, Charles H.	8
			House	Ways and Means	Rostenkowski, Daniel D.	2
5	1981	OR	Senate	Appropriations	Hatfield, Mark O.	4
			Senate	Commerce	Packwood, Robert W.	3
6	1983	FL	House	Foreign Affairs	Fascell, Dante B.	6
			House	Rules	Pepper, Claude D.	4
7	1993	CA	House	Transportation	Mineta, Norman Y.	12
			House	Armed Services	Dellums, Ronald V.	8
8	1995	NY	House	Rules	Solomon, Gerald B.H.	6
			House	Foreign Affairs	Gilman, Benjamin A.	2
9	1995	PA	Senate	Intelligence	Specter, Arlen	2
			House	Transportation	Shuster, Bud	2
10	1995	TX	House	Intelligence	Combest, Larry	2
			House	Ways and Means	Archer, Bill	1
11	2001	WV	Senate	Appropriations	Byrd, Robert C.	4
			Senate	Veterans	Rockefeller, John D., IV	4
12	2007	CA	House	Foreign Affairs	Berman, Howard L.	6
			Senate	Rules	Feinstein, Dianne	4
13	2007	HI	Senate	Commerce	Inouye, Daniel K.	2
			Senate	Veterans	Akaka, Daniel K.	2
14	2007	MI	House	Judiciary	Conyers, John, Jr.	6
			Senate	Armed Services	Levin, Carl	4
			House	Energy & Commerce	Dingell, John D., Jr.	2
15	2007	NY	House	Rules	Slaughter, Louise M.	8
			House	Ways and Means	Rangel, Charles B.	6
16	2009	CA	Senate	Intelligence	Feinstein, Dianne	2
			House	Energy & Commerce	Waxman, Henry A.	2
17	2011	CA	House	Armed Services	McKeon, Howard P. (Buck)	4
			House	Rules	Dreier, David	4
18	2011	FL	House	Transportation	Mica, John L.	4
			House	Foreign Affairs	Ros-Lehtinen, Ileana	3
19	2011	MI	House	Intelligence	Rogers, Mike	4
			House	Energy & Commerce	Upton, Frederick S.	2
			House	Ways and Means	Camp, Dave	1

Apendix Table 6: Components of Traded and Non-Traded Price Bundles

Traded		*Non-traded*
Antibiotic Ointment	Ground Beef	Apartment
Aspirin	Hamburger Sandwich	Automobile Registration
Atorvastatin Calcium	Ibuprofen	Automobile Repair
Baby Food	Jeans, man's	Beauty Salon Visit
Bacon	Lettuce	Bowling
Bananas	Liquor	Commuter Fare
Beer	Man's Dress Shirt	Dentist, Office Visit
Board Game	Man's Slacks	Doctor, Office Visit
Boy's Jeans	Margarine	Dry Cleaning
Boy's Underwear	Natural Gas/ Other Energy	Hospital Room
Bread, white	Newspaper	House Purchase, Monthly Payment
Canola Oil	Peaches, canned	House Purchase, Mortgage Rate
Cheese	Peas, canned	House Purchase, Total Sales Price
Chunk Light Tuna	Pizza	Major Appliance Repair
Cigarettes	Potato Chips	Man's Haircut
Coffee, vacuum packed	Potatoes	Movie
Corn Flakes	Sausage	Optometrist
Corn, canned	Shampoo	Taxi Fare
Dishwashing Powder	Shortening	Telephone
Eggs	Soft Drink	TV Repair
Electric Power	Steak	Veterinary Services
Fresh Orange Juice	Sugar	Woman's Shampoo & Set
Fried Chicken	Tennis Balls	
Frozen Corn	Tissue, Facial	
Frozen Green Beans	Tissue, Toilet	
Frozen Meal	Tomatoes, canned	
Frozen Orange Juice	Toothpaste	
Frozen Peas	Washing Powder	
Frying Chicken	Whole Milk	
Gasoline	Wine	
Green Beans, canned	Women's Slacks	